

Impact of globalization on food consumption, health and nutrition in Nigeria

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INTRODUCTION

Globalization refers to the way in which developments in one region can rapidly come to have significant consequences for the security and well-being of communities in quite distant regions of the globe. As there can be no island of prosperity in an ocean of economic instability, globalization expresses the widening scope, deepening impact and speeding up of interregional flows and networks of interaction within all realms of social activity from the cultural to the criminal (McGrew, 2000).

Globalization is a force that can neither be halted nor ignored. This implies greater difficulties for countries trying to isolate themselves from the world marketplace. It offers growth prospects to national economies if they satisfy its requirements in terms of flexibility and competitiveness, which include designing and implementing domestic policies to meet global requirements (International Monetary Fund, 1997). It is argued that countries can be exposed to new technologies and ideas, which can create jobs, improve incomes and reduce poverty. This is predicted to have a positive influence on the health and nutritional status of people across the world. There is the presence of the perpetuation of social vulnerability (Bahalla and Lapeyre, 1999). Also, advances in information technology may have profound effects that directly influence health (Daulaire, 1999). The glamorization of self-serving and unsustainable lifestyles is one of the effects of the spread in information technology, which may negatively affect health status and worsen poverty.

In Nigeria, the institution of various reforms, starting with the Structural Adjustment Programme (SAP) of 1986 and membership in the World Trade Organization (WTO) placed the country under the umbrella of globalization. The resultant deterioration in the human development indices is a source of serious concern in the country. In absolute terms, the urban poverty level increased from 17.2 percent in 1980 to 58.3 percent in 1996 (Soyibo, Alayande and Olayiwola, 2001). The nutritional status of the average Nigerian remained precarious as the country consistently recorded deficit average per capita calorie intake. Food deficits of 31 percent and 20 percent in 1980 and 2000 respectively were recorded (Okojie *et al.*, 2001). A number of pertinent questions come to mind in relation to the extent to which globalization has impacted on food consumption, health and nutrition in Nigeria and how the country can take advantage of globalization to improve the health and nutrition status of its people. These are some of the issues this paper addresses.

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We also discuss the conceptual approach and methodology adopted by the paper, while highlighting Nigeria's position in the globalizing world. We analyse the role of globalization on dietary change and lifestyles in Nigeria, trends in malnutrition in urban areas, and discuss trends in health status in the urban environment. Finally we examine government-sponsored nutrition programming in the country, and present our conclusions.

CONCEPTUAL FRAMEWORK

Conceptual framework for analysing linkages between globalization, food consumption, health and nutrition

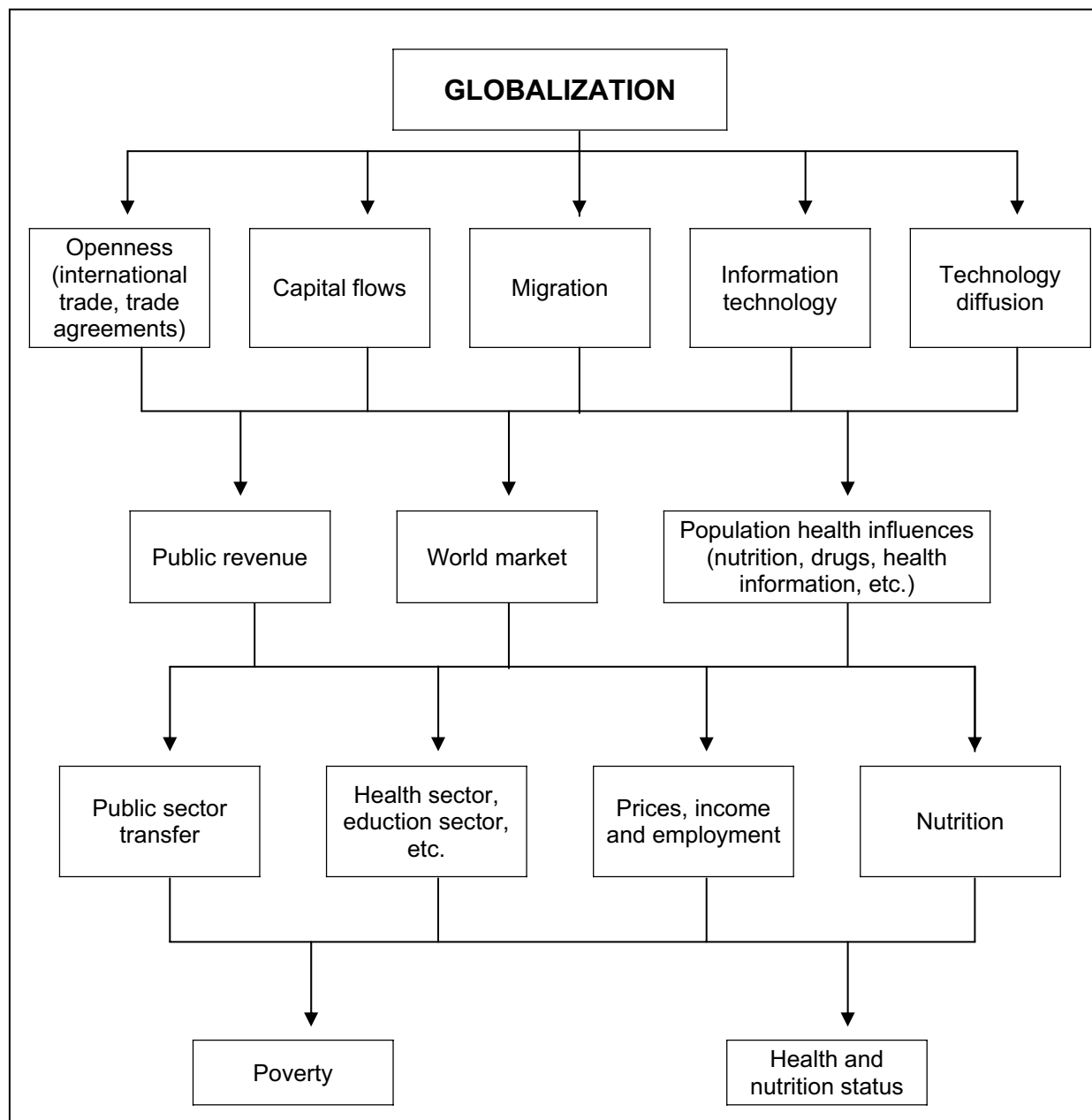
The framework focuses on the linkages between the different strands of globalization and components of poverty, nutrition and health as identified in the literature. Thus, it focuses on openness to international trade/trade agreements, capital flows, migration, information technology and technology diffusion and discusses how each of these can be linked to problems of poverty, nutritional and health status (Figure 1).

The framework shows that openness to international trade will lead to greater integration into the global market which, in turn, could increase exports, output and income. This would reduce poverty by expanding the opportunities of the poor in terms of ownership or access to productive resources, infrastructure, financial services and social networks. It will also allow countries to concentrate on those activities in which they enjoy comparative advantage and subjects firms to healthy foreign competition. Therefore, the poor can gain from the advantages of trade liberalization by specializing in the production of goods that make use of their abundant, low-cost and unskilled labour.

International trade agreements affect the health status and general well-being of people. For example, trade-related aspects of intellectual property rights allow access to essential life-saving drugs that are non-affordable by low-income countries, regardless of the level of their public health expenditure. Innovations as inspired by the duo of large market and intellectual property rights ensure adequate rewards of innovators. While trade can contribute to improved welfare through increased drug availability, the associated negative externality of possible infections carried across borders could adversely affect not only people's health, but also their general well-being.

With the employment generation potential of globalization, women are likely to become more involved in the labour force. The potential helpful or harmful effect this may have on child health is a subject needing more research, especially where adequate child care institutions are lacking. Migration can lead to improved nutritional and health status through movement of people across national borders, which is expected to ease labour bottlenecks and lead to transfer of technological knowledge. The process of globalization can help to improve the skills of the poor through technology diffusion and capital flows. Transnational migration may be a drain on the brain power of countries, but may also lead to significant cash remittances returning home.

FIGURE 1
Linkages between globalization, food consumption, health and nutrition



Methodological approach

Globalization has an impact on various elements of the economy: international trade, capital flows, migration, communication and information technology as well as technology diffusion. To the best of our knowledge, there is no study, as yet, that has assessed the impact of globalization on food, nutrition and health in Nigeria. Accordingly, we shall adopt an indirect approach, by analysing the impact of globalization on these issues, in relation to policy development, generation of ideas and disparate intervention programmes in the country.

As globalization is not new, some authors conceive of internationalization, liberalization and policy reforms as forms of globalization. We shall adopt a historical approach. The current globalization efforts are viewed to have started the liberalization and

reforms efforts of SAP, which began in 1986. We have used secondary data and the results from many other studies in this paper. Data for our analysis are based on various publications of the United Nations Development Programme (UNDP), the World Bank and the Central Bank of Nigeria (CBN), together with six major health and nutrition surveys conducted between 1990 and 2003.

NIGERIA'S POSITION IN THE GLOBALIZING WORLD

The dismal picture of Nigeria's vulnerability to poverty in the globalizing era can be illustrated within the context of macroeconomic indicators. The Nigerian macroeconomic environment portends a picture that limits the ability of the poor to tap into economic opportunities of globalization that can free them from poverty. The balance of payments position is highly precarious in the face of huge external debt and debt servicing requirements (Table 1). This tends to limit the amount of resources available to revitalize the collapsing basic social and economic infrastructure. The country has also witnessed persistent high rates of inflation in the 1990s. Inflation contributes to the vulnerability of the population because it undermines investment and impedes economic growth.

The capacity utilization in the manufacturing sector in the 1990s that hovered around 29 and 39 percent hindered the employment capacity of the sector. The consequence of this is the ballooning informal sector that provides as high as 75 percent of employment in Nigeria. The low level of government budgetary allocation to both health and education is also a clear indication that priority is not placed on activities that have direct links with health and nutritional status. Expenditure on health fell from 3.30 percent in 1995 to 2.92 percent in 2000, while the proportion of government expenditure to education also fell from 6.33 percent in 1995 to 3.33 percent in 1999, before it was increased to 5.87 percent.

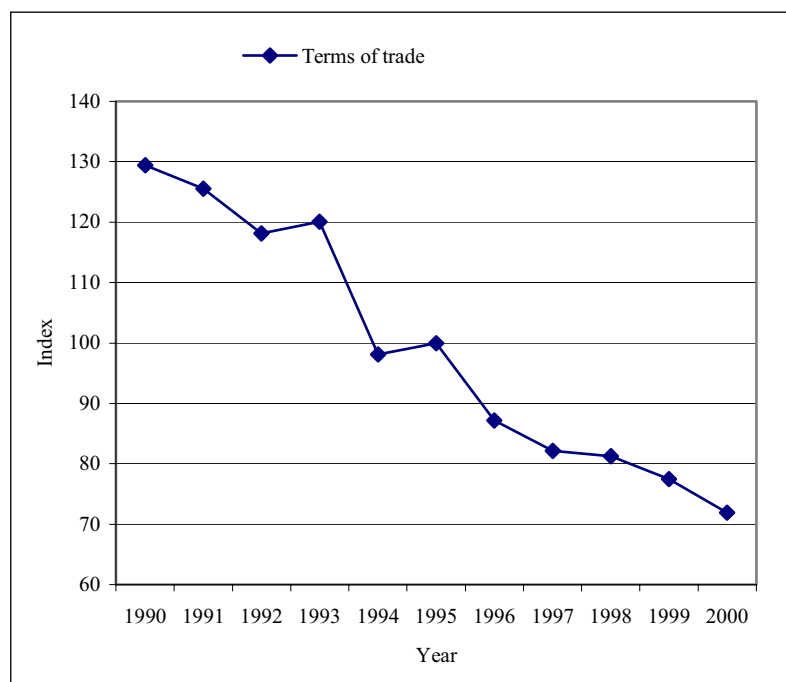
TABLE 1
Selected social and economic indicators in Nigeria

	1995	1996	1997	1998	1999	2000	2001
Overall balance of payment as % of GDP	-3.1	-5.6	0.04	-7.7	-9.7	6.3	0.5
Interest rate differentials (%)	7.57	8.03	12.3	11.6	17.7	16.0	19.2
Government expenditure on health (% of total)	3.30	2.57	1.71	2.80	1.71	2.92	4.39
Government expenditure on education (% of total)	6.33	8.12	3.92	5.05	3.33	7.07	5.87
Life expectancy	52	53	53	54	54	54	54
Infant mortality rate (per 1 000 births)	114	114	114	75	75	75	75

Source: Central Bank of Nigeria, 2001.

In terms of trade performance, the value of exports that rose rapidly from US\$3.47 billion in 1973 to a peak of US\$26.10 billion in 1980 fell drastically to US\$12.88 billion in 1999 (Oyejide, 2001). However, the value of imports rose from US\$6.04 billion in 1980 to a continuous rise of US\$8.59 billion in 1999. This clearly shows that globalization had a more expansionary impact on imports than exports in Nigeria. The consequence of this development is deteriorating terms of trade during this period (Figure 2).

FIGURE 2
Behaviour of Nigeria's terms of trade (1995 = 100)



Source: Central Bank of Nigeria, 2002.

In order to provide an understanding of the environment within which globalization is taking place in Nigeria, an overview of the political and institutional developments is helpful. This is based on the economic intelligence ranking of countries between 1993 and 1997, but projected to 2002. The political environment is based on two major indicators – political stability and political effectiveness (see Olayiwola, 2003). This is selectively shown in Table 2.

Table 2 shows that Nigeria ranks lowest among the African countries included in the survey. The country has become politically unstable since 1993 when a presidential election was annulled. The governance outlook of the country took a different turn with the return to democratic rule in 1999. Nigeria also falls below average in terms of political effectiveness.

In the context of the Human Development Index of UNDP (2001), welfare seems to have improved in Nigeria from 0.322 in 1990 to 0.400 in 2000. The level of urbanization rose from 31 percent in 1985 to over 43 percent in 2000. As the urban population increased from 29.6 million in 1985 to 68.9 million in 2000, the rural population followed suit as it increased from 65.6 million to 90.3 million during the same period. This trend in urbanization is associated with problems of unemployment and lack of basic services such as water, sanitation and health care (Mabogunje, 1974). These problems arise because of the obvious mismatch between the growth of the urban population and available resources. The second problem is the character of urban growth, as a result of rural-urban migration. For example, Lagos city in Nigeria witnessed a remarkable increase in population from 5.83 million in 1985 to 12.89 million in 2000 (Abumere, 2001).

TABLE 2
Political environment ranking of countries, 1998-2002

Country	Political stability	Political effectiveness	Overall political environment	Total score	Rank
Netherlands	9.6	9.3	9.4	8.82	1
United Kingdom	8.2	9.6	9.0	8.77	2
United States	8.2	7.4	7.8	8.59	4
South Africa	6.0	5.1	5.7	6.31	37
Egypt	5.5	5.1	5.3	5.91	41
Indonesia	3.3	3.6	3.5	5.63	47
Algeria	4.2	4.0	4.1	4.73	57
Nigeria	2.4	1.8	2.0	4.17	58
Iraq	1.5	1.8	1.6	2.03	60
Average	6.9	6.1	6.5	6.78	
Median	6.9	5.9	6.5	6.83	

Source: Adapted from Olayiwola, 2003.

The indicators of another dimension of globalization, information technology, are also considered. According to the International Telecommunication Union, teledensity was 34.38 in Europe in 1997, 30.38 in the Americas, 6.02 in Asia and 1.85 in Africa. In 1998, Nigeria had the lowest teledensity (4), compared to South Africa (115), Senegal (16) and Côte d'Ivoire (12). Cellular density (as a percentage of total telephone lines) for the Americas was 6.92 (18.6 percent), in Europe 4.57 (11.7 percent), in Asia 1.35 (18.3 percent) and in Africa 0.17 (8.4 percent). The number of mobile telephones per 1 000 people in Nigeria was 0.01 in 1998. This number was insignificant compared to that of South Africa (56), Indonesia (5) and Egypt (1). The number of personal computers per 1 000 persons was 5.7 in Nigeria compared to 47.4 in South Africa, 9.1 in Egypt and 11.4 in Senegal (Table 3). As of 2000, the number of Internet hosts per 1 000 people was the smallest in Nigeria (0.01) compared to that of the Republic of Korea (60.03), South Africa (39.17), Indonesia (1.0) and even Senegal (0.32). In terms of television sets per 1 000 people, the Nigeria figure of 66 in 1998 was only better when compared to Senegal (41) whose GDP is less than one-third of the country (Olayiwola, 2001).

Nigeria has recorded a rising profile of cyber cafes and Internet usage. From a mere 17 cafés in 1998, the number increased to no less than 1 500 cafés in 2003. There were 153 350 Internet users in 2001. Moreover, Nigeria accounted for the largest Internet usage in 2001 in West Africa. Nearly one out of every two West African users of the Internet was a Nigerian. However, Internet penetration was 0.08 percent of the entire population. Access to electricity is very low in the country. Less than 30 percent of the population has access to electricity. As of 1997, the consumption per capita of electric power was 84 kWh in Nigeria, a marginal increase from 77 kWh in 1990. But in the context of transmission and distribution losses, the Nigerian figure of 32 was more than triple that of the Republic of Korea (4) and South Africa (8).

TABLE 3
Communication, information, science and technology indicators¹

Country	Daily newspapers	Radio	TV	Telephone mainlines	Mobile phones	Personal computers	Internet host
United States	215	2 146	847	661	256	459	1 938
United Kingdom	329	1 436	645	557	252	263	321
Indonesia	24	156	136	27	5	8	1
Korea, Rep.	393	1 033	346	433	302	157	60
South Africa	32	317	125	115	56	47	39
Nigeria	24	223	66	4	0	6	0.01
Côte d'Ivoire	17	164	70	12	6	4	0.42
Senegal	5	142	41	16	2	11	0.32
Egypt	40	324	122	60	1	9	0.73

¹Per 1 000 persons in various years (1996-2000).

Source: World Bank, 2000.

In spite of this relatively poor performance when compared with other countries, overall the country can be said to have witnessed significant performance in attracting foreign investment since the advent of representative democracy in 1999, compared to the military dictatorship of the previous 15 years. In the last four years, a total foreign investment of over N70 billion has come into the country. In the area of Information and Communication Technologies (ICTs), four global systems of mobile communication operators have provided an additional 2 million lines within two years. Although Nigeria's cost of mobile calls is one of the highest in the world because of the poor state of infrastructure, competition in the market in the next few years is expected to bring down the costs. The number of motor vehicles increased threefold from four to 12 per 1 000 people in 1980 to 1987, and the number of passenger cars also increased from three per 1 000 people to seven per 1 000 people. This was not matched by corresponding kilometres of paved roads, which increased marginally from 3 km per 1 000 km road to 7 km per 1 000 kilometre road. The resultant effect of this is the increase in traffic accidents from 123 per 1 000 in 1980 to 732 per 1 000 in 1998. Moreover, the number of air passengers has also decreased tremendously. International passengers decreased from 228 516 in 1994 to 40 166 in 1998. The same situation occurred with domestic passengers; they decreased from about 4.4 to 0.92 million during the same period.

ROLE OF GLOBALIZATION AND URBANIZATION ON DIETARY CHANGE AND LIFESTYLES

Globalization (trade liberalization) and trends in food supply

A cursory look at the aggregate food consumption shows some improvement within the period under consideration. The per capita calorie availability of the average Nigerian has fluctuated over the years. This situation tends to mirror the domestic production of staple crops. The index of food crop production increased from 90.74 in the period 1980-1984 to 296.44 in 1998-2002 (Table 4). This increase in domestic production did not translate into increased food supply because of two major factors. First, farm food losses remained consistently high throughout the same period.

TABLE 4
Per capita calorie availability and index of food production in Nigeria

Year	Index of food crop production	Average per capita calorie availability	Deficit/surplus of per capita calorie availability (%)
1975-1979	99.98	1 761	-27.2
1980-1984	90.74	1 680	-30.6
1985-1989	135.62	2 024	-16.3
1990-1994	245.12	2 200	-9.1
1995-1997	285.40	1 942	-19.7
1998-2002	296.44	2 043	-18.4

Source: Okunmadewa *et al.*, 1999; Central Bank of Nigeria, 2002.

Second, an upward trend in consumer price indices is generally noticeable and this is more pronounced in the period after 1986 and also in 1993-1995 (Table 5). The price situation of food items was in general more favourable before 1986 than thereafter. With measures in place to discourage importation, particularly of food items and with the devaluation of currency by the deregulated exchange rate, prices of consumer items rose astronomically after 1986. This implies low purchasing power of the people, especially wage earners, thereby adversely affecting the food security situation in the 1986-2000 period. The food price index increased from 3 044 in 1998 to 4 560 in 2002 and this increase was more pronounced in the urban areas, where it increased from 2 944.2 to 4 562.10 during the same period.

TABLE 5
Average food prices and food imports in Nigeria

	1970-74	1975-80	1981-85	1986-92	1993-95	1998-2002
Consumer price index (1985 = 100)	11.74	30.97	73.66	226.03	1 125.68	3 837
Total import (N million)	1 176.6	6 621.3	7 858.2	33 594.4	281 594.9	1 051 960
Food import (N million)	104.6	823.1	1 308.7	2 256.2	29 798.8	123 644
Food import as % of total import	8.8	11.8	17.2	9.0	9.7	11.75

Source: Central Bank of Nigeria, 2002.

Although there were increases in production, especially since 1986, these have been inadequate to feed the country, which therefore meant importation of food. The country's share of food imports in total imports generally increased during the decade of the 1990s. The average value of food imports increased from N823.1 in 1975-1980 to N123 643.62 in 1998-2002, as the share of food imports also jumped to 11.75 percent in 2002 (Table 5). The implication of this is that Nigeria consistently complemented domestic food production with imports. This paints a picture of significant dependence on food imports, which is strategically risky and financially expensive.

Other developments on the issue of globalization and dietary change are the importance of street foods and the emergence of fast food chains in Nigeria. Akinyele (1998) had previously shown that civil servants, skilled and unskilled and low-income families constitute the major patrons of street foods since they have to eat at least one meal outside the home. He found that two-thirds of the population's daily meals are bought from vendors and fast food chains. Street foods constituted at least one-third of their daily nutrient intakes. Street foods and fast foods contributed between 53.2 to 92.6 percent of the

total nutrient intake of people of 21-40 years old, the primary consumers of these foods. People under 20 consume street and fast foods because of their sporadic quest for food at any time of the day. Ready to eat foods accommodate their lifestyle more than foods that must be taken home and prepared.

The changing role of women and urbanization on child care and feeding

Child care is influenced by women's health status, the time that mothers spend with their children, breastfeeding practices, complementary feeding, and the cultural beliefs and practices that influence these behaviours. It is therefore worthy to note that adequate income, greater food availability and expanded health services are necessary for improved nutrition, and these factors will not bring improved nutrition unless households are able to take advantage of them. Alayande, Olayiwola and Olaniyan (2000) had shown that women in formal employment in Nigeria had increased by 65 percent. The implication of this is that women's "heavy burden of production and reproduction" and high maternal mortality rates limit their capacity to care for their children. The dual demands of work outside and within the home leave women with less than four hours per day for child care. In a survey conducted by Akinyele (1998), 43.9 percent of working mothers kept their older children at home. Some made use of the available community child care centres (12 percent), while 12 and 5 percent kept their children in fee-paying nursery schools or in the custody of househelp.

Infant and child feeding practices generally are not appropriate for good nutrition. Tradition and/or women's economic responsibilities lead to low rates of exclusive breastfeeding (EBF) and the early introduction of complementary feeding. The rate of EBF increased from 2 to 20 percent during 1990-1999 for infants up to three months, but it is still low (National Population Commission, UN Population Fund and US Agency for International Development, 2000). A decade ago most mothers did not practise EBF and did not think that it was feasible. Although 96 percent of infants in Nigeria are breastfed, the median duration of EBF is less than one month and that of full breastfeeding is just over two months.

The urban rates of breastfeeding infants within an hour or a day of birth are higher than the rural rates (74 percent of urban mothers breastfeed within a day, versus 63 percent of rural mothers). This difference is attributed to the Baby-Friendly Hospital Initiative that operates mainly in urban hospitals as well as urban women's greater access to health education about breastfeeding (National Population Commission, UN Population Fund and US Agency for International Development, 2000). Women's education also affects breastfeeding: 71 percent of urban mothers with primary and secondary education breastfed their infants within one day of birth, versus 58 percent of mothers with no education. However, infants are breastfed longer in rural than urban areas: 77 percent of rural infants are breastfed at 12-15 months, versus 59 percent of urban infants (Federal Office of Statistics and United Nations Children's Fund [UNICEF], 1999). Overall, the issue in Nigeria is to promote EBF in order to give children a better nutritional start in life.

TRENDS IN MALNUTRITION IN URBAN AREAS

Stunting

The effects of globalization such as improvement in information, education and the communication activities of health promotion seem to have influenced infant breastfeeding positively in Nigeria. However, the gains appear diminished by early introduction of complementary infant formula.

A survey undertaken by the Federal Office of Statistics (FOS) in 1990 found that 43 percent of preschool children were stunted. It also reported that a higher proportion of children in rural areas are more malnourished than those in urban areas. The Federal Ministry of Health (FMOH) and Social Services and USAID (1993) showed that the prevalence of stunting among children declined slightly from 43 percent in 1990 to 40 percent in 1993. The Federal Government of Nigeria (FGN) and UNICEF (1994) also reported an increase in the prevalence of stunting from 43 percent in 1990 to 52 percent in 1994. FOS and UNICEF (1999) indicated that the prevalence of stunting decreased to 32 percent in 1999 and also showed that stunting is more prevalent in rural than urban areas. FGN *et al.* (2003) indicate that the prevalence of stunting is still high at 42 percent, and comparable to the previous rates reported between 1990 and 1999 (Table 6).

TABLE 6
Trends in stunting and wasting in children, 1990 - 2003

Survey year	Age	Stunting (%)			Wasting (%)		
		Total	Urban	Rural	Total	Urban	Rural
1990	< 5 years	43	35	46	9	7	10
1993	6 months-6 years	40	35	45	21		
1994	< 5 years	52	-	-	11		
1999	< 5 years	32	23	38	16	14	16
1999	< 3 years	46	42	47	12	11	13
2003	< 5 years	42	36	44	9	8	10

Sources: The surveys used in the analysis include the 1990 Nigeria Demographic and Health Survey (NDHS) undertaken by the Federal Office of Statistics and IRD/MACRO International published in 1992; the 1993 National Micronutrient Survey (NMS) published by the Federal Ministry of Health and Social Services and USAID in 1993; the 1994 Participatory Information Collection Study (PICS), published by the Federal Government of Nigeria and UNICEF in 1994; the 1999 Nigeria Demographic and Health Survey (NDHS), published by the National Population Commission, UN Population Fund and US Agency for International Development in 2000; the 1999 Nigeria Multiple Indicator Cluster Survey (MICS) published by the Federal Office of Statistics and UNICEF in 1999; and the 2003 Nigeria Food Consumption and Nutrition Survey published by the Federal Government and partners in 2003.

This analysis of stunting shows that the situation in Nigeria has not improved in the past decade. This is probably a result of the problems of poverty and food security in the country, which worsened during the era of globalization, particularly in rural areas.

Wasting

FOS and IRD/MACRO International (1992) reported that 9 percent of preschool children were wasted with a higher prevalence rate in rural areas. The prevalence of wasting reported by the FMOH and Social Services, USAID (1993) data was 21 percent, twice as high as in 1994 and 1990. This increase reflects short-term deficiencies in nutrition, and suggests a sudden worsening of food insecurity probably due to a sharp accentuation of poverty in the absence of any climatic or human disaster as reported by FOS and UNICEF (1999). FGN *et al.* (2003) also indicated a decline in the national prevalence of wasting or

acute undernutrition to the 1990 level of 9 percent (Table 6). The conclusion is that there has been a gradual decline in the prevalence from 1993 to 2003, although the current level of 9 percent is still not satisfactory.

Underweight

FOS *et al.* (1992) found that 36 percent of schoolchildren were underweight with the prevalence rate about 50 percent higher in the rural areas and the northern zones. FMOH and Social Services, USAID (1993) reported a higher rate of 39 percent and that regional disparities had worsened with one out of every two preschool children in the north underweight. With FGN and UNICEF (1994) data, the rate of underweight declined to 28 percent, while in FOS and UNICEF (1999), there was a decline from 36 percent in 1990 to 30 percent in 1999. The National Population Commission (NPC), UN Population Fund and US Agency for International Development (2000) found that 27 percent of children under three were underweight. FGN *et al.* (2003) reported the rate to decline from 36 percent in 1990 to 25 percent in 2003. In summary, the prevalence of underweight among preschool children was reduced by about 30 percent between 1990 and 1993. According to the current estimate, one out of every four preschool children is underweight.

Women's nutritional status

The close link between maternal undernutrition, low birth weight, and childhood stunting and underweight is only now being revealed with its intergenerational implications. The national surveys provide little information about undernutrition in women in general or pregnant and lactating women.

TABLE 7

Women's nutritional status

	Height <145 cm (%)	Body mass index (BMI) <18.5 (%)	
	NPC <i>et al.</i> , 2000	NPC <i>et al.</i> , 2000	FGN <i>et al.</i> , 2003
Total	7	16	12
Urban	6	15	12
Rural	7	17	13
Mothers' education			
None	9	20	
Primary	5	14	
Secondary	4	12	

Source: compiled by the authors from National Population Commission, UN Population Fund and US Agency for International Development, (2000); FGN *et al.* (2003).

FOS and IRD/MACRO International (1992) reported a national prevalence of short stature of 7 percent in women, with considerable regional variation, but very few urban-rural differences. The prevalence of thinness in women was 16 percent. There was a slightly higher proportion of mothers with low BMI in rural areas (17 percent) than in urban areas (15 percent), and there were also significant regional disparities with the northeast having 25 percent of mothers with low BMI, compared with 20 percent in the southwest, 18 percent in the northwest, 8 percent in the central zone and 7 percent in the southeast.

FGN *et al.* (2003) also used BMI data from women (aged from 15 to 49) as an indicator of their nutritional status. Twelve percent of the women were thin or undernourished and

there were no significant urban-rural differences. However, the prevalence of malnutrition among women in the north was almost twice the rate in the south.

Trends in micronutrient deficiencies, 1993-2003

Three key micronutrient deficiency disorders, vitamin A deficiency (VAD), iron deficiency anaemia (IDA) and iodine deficiency disorders (IDD) are common in many parts of Nigeria. Two national surveys provide data (Table 8) on the prevalence of these micronutrient deficiencies from 1993 to 2003. These are (i) National Micronutrient Survey (FMoH and Social Services, USAID, 1993); and (ii) National Food Consumption and Nutrition Survey (FGN *et al.*, 2003).

TABLE 8
Prevalence (percentage) of micronutrient deficiencies in children and women

Children					
FMoH, 1993	Southeast	Southwest	Northwest	Northeast	All children
VAD	15	24	48	50	33
IDA	6	6	13	15	12
IDD	2	0.3	2	3	2
FGN, 2003	Dry savannah	Moist savannah	Humid forest	Urban/rural	All children
VAD	31	20	26	20/27	27
IDA	34	20	15	28/20	22
IDD	3	5	2	3/6	4
Women					
FMoH, 1993	Southeast	Southwest	Northwest	Northeast	All women
IDA	10	5	4	20	9
IDD	0	5	5	0.7	3
FGN, 2003	Dry savannah	Moist savannah	Humid forest	Urban/rural	All women
VAD	20	15	9		13
IDA	23	20	22	11/11	13
IDD	5	7	7	2/5	6

Source: compiled by the authors from FMoH and Social Services, USAID (1993); FGN *et al.* (2003).

Vitamin A deficiency

According to FMoH and Social Services, USAID (1993), almost one in every three children was vitamin A deficient. FGN *et al.* (2003) reported the rate to range from 20 to 31 percent for children under five (Table 8). It also reported the rate of 9 to 20 percent for pregnant women. The regional variation of VAD prevalence may be attributed to food consumption patterns in Nigeria, particularly the variation in the consumption of foods rich in vitamin A among people living in different ecological zones. These foods, especially green leafy vegetables, fruit and palm oil are much more prominent in diets in southern Nigeria.

Iron deficiency anaemia

FMoH and Social Services, USAID (1993) reported a prevalence rate of IDA to be 12 percent in children. The northwest and northeast had the highest rate of 13 percent and 15 percent respectively. FGN *et al.* (2003) reported an increased national prevalence rate of 22 percent among preschool children with the dry savannah having the highest prevalence of 34 percent and the humid forest the lowest rate of 15 percent. FMoH and Social Services, USAID (1993) reported a national prevalence of 9 percent of IDA in women of reproductive age with the northeast having the worst rate of 20 percent followed by the southeast with 10 percent. This rate had increased to 13 percent as reported by FGN *et al.* (2003). Moreover, the dry savannah had the highest rate of 23 percent while the moist savannah had the lowest rate of 20 percent (Table 8). The data available show that iron

deficiency anaemia is still a serious problem that must be addressed in view of its implications for child survival and pregnancy outcome.

Iodine deficiency disorders

FMoH and Social Services, USAID (1993) reported the national prevalence rate of IDD in children to be 2 percent. There was insignificant difference among the zones. FGN *et al.* (2003) results show that the national prevalence of IDD among these preschool children is 4 percent with insignificant agro-ecological zonal differences. FMoH and Social Services, USAID (1993) also measured IDD in women and defined it in terms of the visible goitre rate. The national prevalence rate was 3 percent with the northwest and southwest having the highest rate of 5 percent. FGN *et al.* (2003) reported a national prevalence rate of 6 percent in women using urinary iodine as the indicator. Both the humid forest and moist savannah had the highest rate of 7 percent but there were no rural-urban differences. The review of micronutrient deficiencies in Nigeria suggests very little direct impact of globalization on these deficiencies in the country, which are mostly a result of ecological differences. However, external funding that in part helped to conduct these studies can be seen to have some positive effect at least in giving basic data about the situation. The next level of assistance can take this as a starting-point.

TRENDS IN HEALTH STATUS IN THE URBAN ENVIRONMENT

The anthropometric data show that rural children's rates of stunting, wasting and underweight were consistently higher than urban rates from 1990 to 2003. More than one-third of the urban population has consistently suffered from chronic malnourishment since 1990. However, there is little contrast in urban wasting rates, which have been 7 to 10 percent since 1990. Urban underweight rates have increased from 20 percent in 1990 to 27 percent in 2003. In the context of urban women's nutritional status, based on height and thinness indices, 12 percent of urban women are currently undernourished (FGN *et al.*, 2003).

Micronutrient deficiency rates also vary along the urban/rural continuum, according to FGN *et al.*, 2003. This is the only survey that has information on *urban/rural* micronutrient deficiency rates, so there are no other data for comparison or to establish trends. The data show that micronutrient deficiencies exist in the urban sector. Urban children have a VAD rate of 20 percent and a slightly higher IDA rate of 37 percent. Urban women's VAD and IDD rates are 14 and 18 percent respectively.

Disease is another indicator of health status. Of particular interest are diarrhoeal, water-borne, infectious and non-communicable diseases. Lack of clean water, sanitation facilities and adequate shelter are associated with these diseases and this is an underlying cause of poor health status. The proportion of urban population that has access to pipes in residence increased from 2.44 percent in 1990/91 to 24 percent in 1999 (Development Policy Centre [DPC], 2002). During the same period, the proportion of the population with access to public taps increased marginally from 21 to 26 percent. The contrast is the case of boreholes, when the proportion fell drastically from 12 to 1.68 percent. In the area of sanitation, the main types in urban populations are private flush toilets, traditional pit toilets and bush or dung hills. The proportion of population with access to pit latrines fell drastically from 74 to 46 percent, but there is a significant increase in the proportion of the population sharing and using bush and dunghills, which increased from 4 and 8 percent to 12 and 10.6 percent respectively. Moreover, the accumulation of refuse in the urban sector is a breeding ground for various diseases. In some selected cities in Nigeria such as Lagos,

Ibadan and Kano, the volumes of solid waste generation increased from 786 079, 440 956 and 402 133 tonnes in 1990 to 998 081, 559 882 and 535 186 tonnes in 2000, respectively (Abumere, 2001).

Nigerians are also vulnerable to idiosyncratic shocks, especially health risks. Infectious diseases characterize the Nigerian epidemiological pattern, which has been worsened by malnutrition and high fertility in recent times. The Nigerian epidemiological environment is dominated by the prevalence of malaria. This problem is further aggravated by the existence of drug-resistant malaria. The occurrence of resistance to malaria drugs moved from 2 percent in 1992 to 40 percent in 1996, while resistance varied between 20 and 50 percent all over the country in 1999 (DPC, 2002).

In urban Nigeria, the incidence of sexually transmitted infections (STIs) is on the increase, especially in the slums. Gonorrhoea, chlamydia, genital herpes and warts were ranked among the ten most reported notifiable diseases in 1999. The reason adduced for the increase is the problem of self-medication, which is widely practised with respect to STIs. The presence of commercial sex workers, who routinely use antibiotics, and men using orthodox and/or traditional medication, make these diseases more prevalent.

The incidence and burden of HIV/AIDS are on the increase in the country. HIV prevalence has increased progressively among the general population, using antenatal clinic attendees as proxy, from 1.8 percent in 1991 to 5.4 percent in 1999. High-risk groups in Nigeria, with higher prevalence of HIV than the general population, include commercial sex workers, people infected with STIs, long-distance drivers and urban people. The national HIV/AIDS database shows a progressive increase in the number of cases recorded yearly, from 962 cases in 1989 to 10 296 in 1999 for medical laboratories, and from eight cases in 1989 to 8 633 cases in 1999 for health facilities. The cumulative data showed a total of 32 515 for laboratories, and 24 557 for health facilities. In Nigeria by the end of 1999, there were 2.7 million people living with HIV/AIDS (with a range of 2.1 to 3.2 million), including 1.4 million women and 120 000 children. The estimate also indicates that there were up to 1.4 million AIDS orphans in 1999. The prevalence rate, estimated to be 1.8 percent in 1993, increased by more than 100 percent within a year to 3.8 percent in 1994, to 4.5 percent in 1996 and to 5.4 percent in 1999 (Lambo, 2003).

Globalization eases access to funds from different countries for HIV/AIDS and major diseases of public health concern such as tuberculosis and malaria. Some initiatives are the Global Fund for fighting AIDS, tuberculosis and malaria; the High Indebted Poor Countries Initiatives and other private sector actors; non-governmental organizations (NGOs) such as the Corporate Council on Africa; Abbot Laboratories; Bristol Myers Squibb; and foundations such as the Bill and Melinda Gates Foundation, MetLife, Rockefeller and the John D. and Katherine MacArthur Foundations (Lambo, 2003). The Bill and Melinda Gates Foundation has committed a substantial grant to the AIDS Prevention Initiatives in Nigeria (APIN). Similarly, a number of multilateral initiatives combating micronutrient deficiencies are in place, led by UNICEF and implemented by government agencies and NGOs in Nigeria.

GOVERNMENT-SUPPORTED NUTRITION PROGRAMMING IN NIGERIA

The policy context

We first review briefly a number of policy options aimed at enhancing the nutritional status of Nigeria.

Launching of the National Policy on Food and Nutrition

The National Policy on Food and Nutrition was drafted in 1995, adopted by the government in 1998 and finally launched in November 2002. The policy is expected to serve as a framework to guide the identification and development of intervention programmes aimed at addressing the problems of food and nutrition across different sectors and levels of Nigerian society.

Development of the Nigeria PROFILES

PROFILES, a computer-based nutritional policy analysis and advocacy tool, was developed with existing nutrition data to make an effective case for attention and resources to be allocated to combat malnutrition. This was to be updated with data generated by the Nigeria Food Consumption and Nutrition Survey, 2001.

Universal salt iodization

The introduction and implementation of a policy of universal salt iodization (USI) has proved effective in overcoming IDD. The success of USI can be gauged by the fact that in 1995, it was reported that 97 percent of all food grade salt manufactured in Nigeria was iodized and by 1999, 98 percent of Nigerian households were using the salt.

Vitamin A fortification of flour (wheat/maize), sugar and vegetable oil

The government has published standards for flour (wheat/maize), sugar and vegetable oil, including levels of fortification with vitamin A. These products were selected on the basis of their importance in the national food market and the food consumption habits of the population. The proposed standards were signed into law, making it mandatory for manufacturers to fortify these products. The National Agency for Food and Drug Administration and Control and the Standards Organization of Nigeria are monitoring the implementation of the law and compliance.

Re-establishment of the National Committee on Food and Nutrition (NCFN)

The NCFN was established to coordinate nutrition activities across the sectors and to mobilize resources for nutrition. It has remained dormant over the last few years but has since become active again.

Options to improve food security and nutrition***Strengthen the National Committee for Food and Nutrition***

The consensus is that the NCFN is being revived and is the key government institution for the future, despite its problematical history. The committee's appointed nutritionist needs support for advocacy, and the NCFN needs strengthening and aid to provide strong leadership for improved nutrition in Nigeria. Strengthening includes training on nutrition, as well as vehicles, computers and a communication system.

Relocate the NCFN under the Presidency

The NCFN should be under the Presidency and the Food and Agriculture Organization of the United Nations (FAO) should support the move. FGN involvement in nutrition is critical and this involvement includes recognition of the negative relationship between nutrition and HIV/AIDS that affects the availability and productivity of labour, and therefore also affects agricultural production and food supplies. Relocating the NCFN under the Presidency is necessary to put nutrition and its critical issues on the national agenda, so as to mobilize the attention, funding and action required for progress. The

National Planning Commission (NPC) where the NCFN is at present located has neither the budget nor the expertise in nutrition to assist the NCFN to coordinate nutrition activities effectively.

Coordinate policy-making

This should improve government understanding of the spiral effects of policy and the need for coordinating policy in order to avoid unforeseen and negative effects on food security. The obvious issue in Nigeria is the spiral effect of policies for oil that drive the national economy and ultimately affect all three components of food security – availability, access and utilization.

Nutrition and HIV/AIDS

Nutrition and HIV/AIDS are two parts of a single problem that must be addressed in order to improve Nigeria's food security. The distribution of malnutrition and HIV/AIDS overlaps in the country. HIV/AIDS-affected households need support to access production technologies and economic options to help them maintain their food security and HIV/AIDS-affected people need access to the food and medications necessary to help them remain well-nourished and productive as long as possible.

Build capacity for government data collection

The need to strengthen government capacity for the systematic collection, analysis and distribution of nutrition and health data is critical. The data collection system should include a Geographic Information System to collect data on environmental factors, agricultural production and HIV/AIDS seroprevalence in order to map regional vulnerability to food insecurity. Capacity building should be done through FGN and its civil servants with the objective of strengthening existing government institutions, and not creating parallel donor systems.

Increase academic expertise in nutrition

There is the potential to increase expertise in nutrition in Nigeria's universities through support for higher education. Education in nutrition may be available through a programme such as the US Department of State's "Azikwe Professional Fellowships" that provide short-term training in the United States for Nigerian professionals. Education on the nutrition-HIV/AIDS relationship and its negative effects on nutrition, food security and agricultural production should be a key topic in nutrition education.

Educate women

The consensus is that educating women about key issues that affect child nutrition is essential for addressing widespread child malnutrition in Nigeria. The education could include teaching women about the links between nutrition and disease.

School feeding programmes

The FMoH's Department of Community Development and Population Activities is planning a school-feeding programme and looking for partners to support it. FAO could provide non-commodity support for the programme as well as nutrition education for women and children in the communities where it operates. One option to promote girls' attendance in school is to give their families a food ration to replace the labour they lose by the girls attending school.

Community-based child growth monitoring: the Honduras “Integrated attention to children” model

Honduras historically has been a low-income country with a malnourished population. More than ten years ago it implemented a community-based child growth monitoring system that has been successful at maintaining good nutritional status in children under the age of two. The system is based on training community health workers to collect accurate growth data and to transmit it to the community when negative changes require a response. The community transmits the information to the municipal mayors, who work with NGOs and government agencies to organize a response. The Honduran government’s long-term investment of time and resources is reported as the key to making this system a success. The system could be adapted for Nigeria, based on government commitment to a pilot programme.

Supplements and fortification

The current efforts to provide vitamin A supplements and the options of fortifying flour, sugar and oil should be supported. One option in fortification is to promote the participation of small and medium enterprises that would make fortified flour readily available in rural areas. Fortifying salt with iron, like iodization, is a possibility in the future that is under research outside Nigeria.

Increase agricultural productivity

Agricultural productivity, including the production of roots and tubers through the International Institute of Tropical Agriculture programme, should be increased. This includes diversifying crop production to support dietary diversity, as well as improving storage and processing techniques, marketing networks and roads. The universal aim to increase agricultural productivity in order to improve food security must take HIV/AIDS into account.

Improved food storage, preservation, processing and safety

Post-harvest losses vary between 15 and 40 percent of the total crop production. These could be reduced by improved food storage, preservation, processing and safety at the household level. One option is to educate women on simple, low-level technology. Donor agencies could provide support for advocacy using various media strategies.

CONCLUDING REMARKS

This paper shows that there appears to be a limited direct impact of globalization through the usual roots of trade, migration and information technology at the household level; level of care-providing activities; and the nature of the health environment, including access to health services. The paper demonstrates that in the case of nutrition intervention programmes, funding for policy development and data collection has generally been obtained from donor agencies such as FAO and UNICEF. In particular, the results of these studies are useful in prescribing best practices. As an example, a USAID study prescribed the Honduras “Integrated attention to children” model of community-based child growth monitoring as an approach that Nigeria could adopt and adapt.

Besides funding of HIV/AIDS intervention by APIN and other international agencies, Nigeria should consider fast-tracking the use of regional initiatives to raise funds for combating HIV/AIDS, following the example of the Commonwealth Regional Health Community Secretariat of East, Central and Southern Africa (ECSA). For this purpose, the

West African Health Community may need to be energized and enhanced to perform this singular act.

In conclusion, the impact of globalization on food, nutrition and health in Nigeria has improved with democratic governance. But in the area of trade, migration, ICTs and capital inflows, there is a lot still to be accomplished. Many laudable national policies on information technology, nutrition and health are not yet properly implemented. Therefore, Nigeria runs a high risk of social and economic exclusion if drastic steps are not taken to improve information infrastructure and provide and encourage a conducive business environment. All these issues are basic challenges faced by the government, the private sector, civil society and the international communities.

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Globalization, urbanization and nutritional changes in South Africa

Mickey Chopra¹

INTRODUCTION

The relationship between globalization, urbanization and nutritional changes is one that is receiving increasing attention. South Africa is a particularly interesting case because until the late 1980s the apartheid political regime placed extensive restrictions on the ability of the non-white population to live in many urban centres. The abhorrence of the racist political system also meant that South Africa became a pariah nation sheltered from many of the forces of globalization impacting on most other countries. The last 15 years have witnessed a remarkable transformation not just of the political system, leading to freedom of movement and rapid urbanization, but also the full integration of South African capital into the international markets. Even in this relatively short period these changes have begun to have an impact on the dietary habits and health of South Africans. This paper will briefly review the socio-economic and demographic changes that have resulted and then suggest ways in which these macrolevel changes are influencing dietary intakes and ultimately levels of overweight, obesity and mortality.

Historical background

The victory of the Nationalist Party in 1948 ushered in the apartheid state that systematically discriminated against the majority black population. Some commentators have pointed out that the new regime merely codified a practice that had been going on for many years (Marais, 1998). For example, the 1913 Native Land Act had designated 13 percent of the available land as the only areas that the black population could purchase and reside in. But there is little doubt that the accession to power of the Nationalist Party signified the victory of a particular Afrikaner nationalist ideology. Much has been written about the political and ideological nature of apartheid; however, less prominent is the useful role the political superstructure played for Afrikaner capital in South Africa during this time. Post-war South African economy was dominated by the mineral and agricultural sectors that depended upon a regular supply of cheap and relatively unskilled labour that the apartheid laws were able to supply. The apartheid state actively assisted in the supply and reproduction of such labour: “Massive forced removals saw the labour tenant system replaced by a contract labour system. Between 1960 to 1982, 3.5 million people were forcibly removed by the state. About 700 000 more people were removed from urban areas declared ‘white’” (Marais, 1998, p. 22).

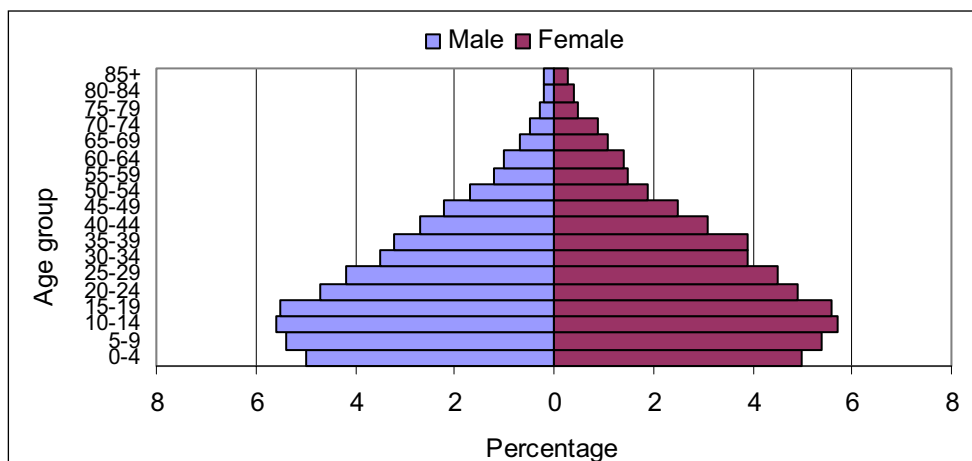
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The creation of “homeland” areas served as dumping grounds for unemployed workers and allowed the cheap reproduction of labour. It also served as a useful way of diffusing and marginalizing any discontent. Strict influx control measures prevented Africans from being physically present in many urban centres. Under this apartheid institutional framework, the market acted “like a malevolent invisible hand, working to the advantage of white workers and capitalists, and widening the wage differentials between black and white workers” (McGrath, 1990). The ratio of per capita incomes of white to black people rose from 10.6:1 in 1947 to 15:1 in 1970 (McGrath, 1990). However, by the late 1980s the contradictions in the system began to unravel. One pertinent example was the increasing defiance of the pass laws – it is estimated that between 1986 and 1990 more than 3.5 million Africans illegally moved from the homelands into “informal” urban settlements (SA Urban Foundation, 1991). Large-scale revolts coupled with continuing economic decline forced the Nationalist Government to negotiate a settlement with the African National Congress ultimately leading to its democratic election in 1994.

South Africa post-apartheid

The recent 2001 census counted 44.8 million people living in South Africa, a rise of nearly 10 percent since the 1996 census. Figure 1 shows the demographic profile of the country from the last census. This census also reveals the continuing migration of people from rural to urban centres. More than 60 percent of the population now live in urban centres. The last five years alone have seen more than 3 million people migrate from rural to urban areas. While there are important economic differences between rural and urban areas (20 percent higher unemployment levels and worse infrastructure in rural areas), researchers have also found that the relatively cheap cost of transport (for travel between rural and urban areas) and the existence of family networks in urban areas encourage this urban migration.

FIGURE 1
Percentage of the total South African population in each five-year age group by sex, October 2001



Source: Census 2001

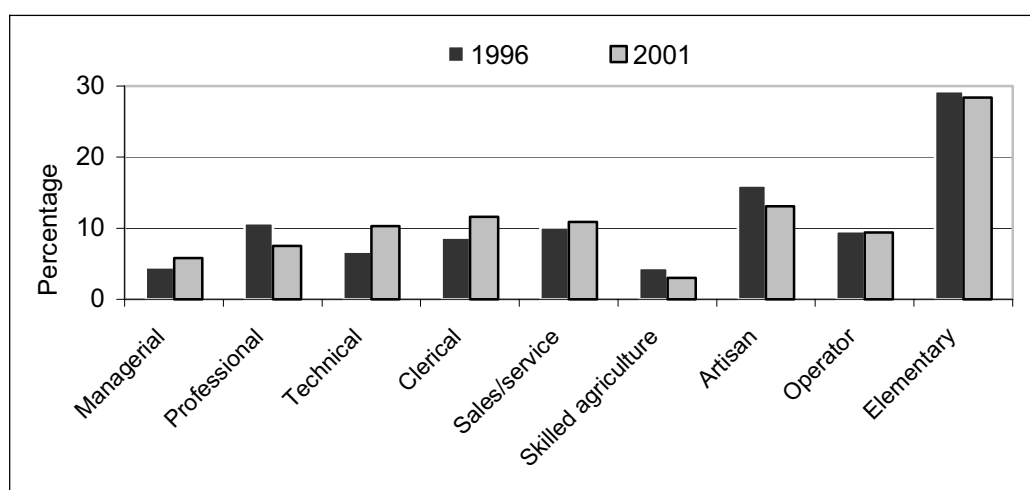
Socio-economic transformation

While the political transformation in South Africa has received the most international attention, it has been the economic transformation that has probably most affected the lives of ordinary South Africans. Not only has South Africa become exposed to the forces of global capital and markets but the economic policy pursued by the government very

closely follows that proscribed by the Bretton Woods institutions. South Africa is classified as a middle-income country with an average income of US\$1 753 per capita (UNDP, 2001). Despite the reasonable average income, there are high levels of poverty. Depending on the poverty line and the methodology used there are various estimates of the extent of poverty. Statistics South Africa estimate that 52 percent of households were living in poverty in 1996 and that the Gini coefficient for South Africa is currently 0.58, the second highest in the world (Statistics South Africa, 1996).

The rapid dismantling of tariffs has resulted in sharp declines in employment, especially in the textile and manufacturing sectors. On the other hand, the depreciation of the currency has led to increases in some sectors such as tourism. Overall it has been estimated that over one million jobs have been lost, predominantly among artisans and unskilled workers (Figure 2).

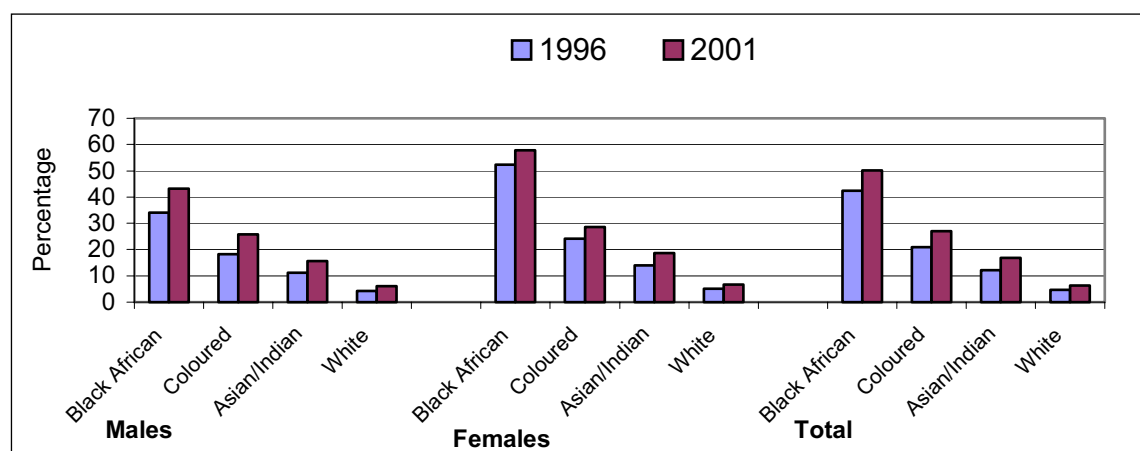
FIGURE 2
Percentage of the employed aged 15 to 65 years by occupational category,
October 1996 and October 2001



Source: Census 1996 and 2001.

This led to a significant growth in unemployment from 33.0 percent in 1996 to 41 percent in 2001 (Statistics South Africa, 2003). This increase has disproportionately affected the majority of the African population with unemployment increasing from 42.5 to over 50 percent in just five years (Figure 3). The loss of jobs in the formal sector is giving rise to so-called informal sector jobs. These include activities such as hawking, food retailing and home-based manufacturing. There is some debate as to whether this is an economically healthy development. The example of Silicon Valley is often cited as a way in which less regulated and smaller firms can achieve far greater flexibility in response to a global market. However, studies of most informal economies in Africa have shown that it is extremely difficult for small companies to grow without significant external inputs that in the present climate of reduced state investment are usually not forthcoming. In most cases the informal economy is a survival strategy rather than an engine for growth (Potter, Binns and Elliot, 1999).

FIGURE 3
Official unemployment rates by population group and sex, October 1996 and October 2001



Source: Census 1996 and 2001.

Nearly one in six of the population lives in shacks. The highest proportion is in the rapidly growing urban populations of Gauteng (25 percent). Access to piped water inside the home appears to have become worse in the last few years and has dropped from 45 to 39 percent. The percentage of households without a toilet was 12 percent in 1996 and decreased to 10 percent by 1999, indicating a slight improvement in access to sanitation. Moreover, 22 percent of households reported periods of hunger by the end of 1999 (Statistics South Africa, 2002).

Increases in inequity

Given the above changes it is not surprising to see that income inequalities have persisted: by 1995 the poorest 40 percent of households accounted for only 11 percent of the total income, while the richest 10 percent commanded 40 percent of the total (May, 2000). Perhaps contributing to a greater perception of exclusion among the African majority is that a small African minority is greatly benefiting from the transition period. The proportion of urban Africans in the richest quintile of the South African population increased fivefold from 1990 to 1995, from 2 to 10 percent. This rise may well have been at the expense of the poor as the poorest 40 percent of the population have experienced a drop in their share of income. The level of income disparity between African households (as measured by the Gini coefficient) rose from 0.3 in 1990 to 0.54 in 1998 (almost the same as the national figure of 0.58) (UNDP, 2001).

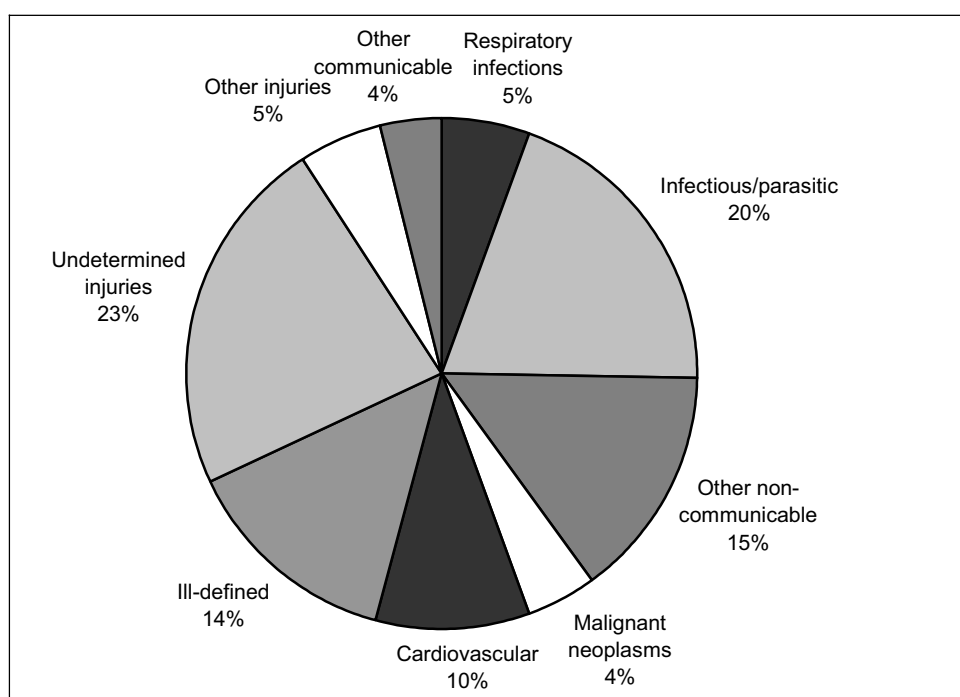
HEALTH AND MORTALITY

The mortality profile in South Africa partly reflects the protracted-polarized model of diseases with poverty-related diseases, as well as chronic diseases related to an industrialized lifestyle and burdens of morbidity and mortality from trauma and violence (Bradshaw and Laubscher, 2002). It is the poor who are suffering from all patterns of mortality at once. Based on the 1996 South African death registration, infectious diseases together with maternal mortality and malnutrition-related conditions account for 30.6 percent of deaths and chronic diseases account for 31.9 percent. Even before the impact of HIV/AIDS, premature adult mortality in South Africa was high, as a result of the triple burden of poverty-related diseases such as tuberculosis and diarrhoea, injuries and emerging non-communicable diseases (NCDs) such as hypertension and diabetes. This is

illustrated in Figure 4, which shows the causes of mortality in the poorest quintile of the population. Even in the poorest quintile, NCDs are responsible for the same proportion of deaths as infectious diseases.

However, this pattern is rapidly being affected by the impact of AIDS. The life expectancy for males is estimated at 59 and for women at 65. It is estimated that premature adult mortality (measured as the probability of a 15-year-old dying before the age of 60) has started increasing and will reach levels close to 80 percent within the next ten years (Dorrington *et al.*, 2001).

FIGURE 4
Male years of life lost in poor areas
N = 446 015



Source: Bradshaw and Laubscher, 2002.

Globalization and urbanization do seem to be changing the exposure to risk factors, especially among the urban poor. For example, a study conducted in the early 1990s found that it was predominantly middle-income men who were most likely to smoke (Steyn *et al.*, 1994). However, by the end of the decade it was poor men in urban settings who were the most likely (Bradshaw and Laubscher, 2002). Local studies have shown the massive increase in cigarette advertising especially in poor urban areas (Benatar, 1999). The 1998 demographic and health survey found that 56 percent of women in South Africa are either overweight or obese (Puoane *et al.*, 2002). Women living in rural areas had a 25 percent less chance of being obese and 37 percent less chance of having hypertension (Bradshaw and Laubscher, 2002).

Changes in diet

A recent review of dietary intake studies concluded that there were some consistent urban/rural differences in food items consumed. Nearly all (98 percent) consumers in the rural areas consumed maize porridge, whereas this decreased to between 27 and 71 percent in urban areas. Portion sizes of maize were substantially higher in rural areas. In urban areas there were more consumers of coffee, carbonated beverages, sugar, meat and offal,

and potatoes. In rural areas there were more consumers of maize, wild leaves and non-dairy creamers. The recent National Food Consumption Survey also reported that children of all age groups living in rural areas had a consistently and significantly lower energy intake than children living in urban areas (Table 1) (Labadarios, 2000).

TABLE 1
Mean energy intakes (sample size = 1 308)

Energy intake	Urban (%)	Rural (%)
Aged one to three		
<50% RDA	20	25
<67% RDA	41	49
>100% RDA	26	18
Aged four to six		
<50% RDA	21	30
<67% RDA	41	53
>100% RDA	21	14
Aged seven to nine		
<50% RDA	21	34
<67% RDA	45	56
>100% RDA	15	12

The post-apartheid era has been marked by the (re)-entry of multinational food companies. South Africa is the most important African market for Coca-Cola, and one of their largest markets in the world (Coca-Cola, 1997). Available in the country for over 60 years, the drink never really left during the sanctions and the apartheid era, simply moving its concentrate plant to Swaziland and selling off its bottling interests, but continuing to sell and advertise its products. After apartheid ended, the company became a leading investor in the country, and now has around 85 percent of the carbonated soft drinks market. This is supported by a \$25 million advertising campaign making Coca-Cola one of the top ten advertisers in the country (AdAge Global, 2001). South Africa is the only sub-Saharan African country with multinational fast food chains. Even before international brands entered the market, South Africa had well-established fast food chains, such as Nandos (chicken) and Steers (burgers). South Africa is also one of Kentucky Fried Chicken's largest markets with over 300 outlets (Hawkes, 2002). McDonald's opened its first outlet in 1995 in Johannesburg. Their outlet expansion programme over the following two years was more rapid than any other country. In 26 months, 30 outlets opened; there are now 103 in all parts of the country but nearly always in urban settings (McDonald's, 2000) Though Steers remains more popular, the entry of McDonald's stimulated the fast food market to become more competitive as a whole.

Increased exposure to fast foods, decreases in the relative cost of meat and high fat foods, and reduced time for food preparation are all changing dietary patterns in the urban setting. Until a couple of decades ago the African population consumed a typical traditional diet, where the fat intake was only 16 percent of the total calories. By 1990 the fat intake in an urban African community had increased to 26 percent (Mollentze, Moore and Joubert, 1993). When these data were analysed further, it was shown that those people who had lived in cities for most of their lives already consumed a typical westernized diet with 30 percent of calories from total fat, while those who had spent less than 20 percent of their lives in the city only consumed 22.5 percent of calories from total fat (Bourne, 1996). Remarkably similar findings have also been recently reported from the Northwest

Province. The proportion energy from fat in the diet increased from 22 percent in the rural population to 31 percent in the settled urban population (Bourne and Steyn, 2000). Other studies report fat intakes of 34 percent (Langenhoven, Steyn and van Eck, 1988) and 40 percent (Vorster *et al.*, 1997) among African urban populations.

CAPE TOWN

The urban setting will be examined more closely by using Cape Town as a case study. Cape Town is situated on the southwestern tip of South Africa and is home to about 3.5 million people. It is the third largest city in South Africa after Johannesburg and Durban. Table Mountain and the spectacular Cape Peninsula are central to Cape Town's beauty, which harbours a vibrant cultural mixture of people. A large part of the less affluent population lives on the lower plains, called the Cape Flats, which were relatively unpopulated until the 1960s. Since then two major waves of human settlement took place: after the 1960s forceful resettlement of so-called "coloured" people by the apartheid government; and in the 1980s, when a then illegal process of African migration started en masse from extremely impoverished areas of the Eastern Cape. At present, the area of Khayelitsha and Greater Nyanga accommodates about 750 000 people. In combination, apartheid spatial planning and strong migratory push factors contribute to the continual urban sprawl of Greater Cape Town and the expansion of its highly racialized economic geographies. While it has unique demographic and historical features, the rapid growth, especially in the poor African townships, with the concomitant social, economic and political challenges make the issues facing Cape Town similar to other cities in South Africa.

Economic insecurity

The uniqueness of the Cape Town urban sprawl is not restricted to its recent and very rapid population growth, but also reflects a melting pot of extremes. Cape Town has a strong and relatively varied economy with a monocentric structure, characteristic of South African cities in general. It is also an extremely polarized city where affluent suburbs and economic centres present a stark contrast to the overcrowded, impoverished township communities. A recent survey of over 1 500 households in the townships by the School of Public Health and the Programme for Land and Agrarian Studies at the University of the Western Cape found that two-thirds (67 percent) of wage earners do not earn enough to push their households above the poverty line, making them the "chronic working poor", and more than half of breadwinners (52 percent) receive less than the minimum wage per month (US\$120). In addition to earning low wages in general, the income stability of those households with employment is very volatile and precarious. For example, in 32 percent of households the main breadwinner had lost his or her job at some stage during 2002, and 31 percent of households suffered the permanent loss of a full-time job during the last five years.

Not surprisingly, many families are struggling to make ends meet and attain food security. Nearly all the households (83 percent) do not have any savings, while most of the remainder reported savings of less than R1 000. Buying food constituted 40 percent of expenditures of households but a significant minority (38 percent) reported spending more than 75 percent on food. Despite the low income levels, 62 percent of all households invested in burial insurance, and 9 percent of households held life insurances.

Food insecurity

Seventy percent of households reported that they went without sufficient food during the last year. When asked specifically about food security in the previous 12 months, 81 percent of households indicated that there was too little food available. Moreover, an average of 43 percent of households has a food shortage at any given time of the year. The reported coping strategies in times of food shortage are summarized in Table 2.

TABLE 2
Coping strategies during times of hunger

Coping strategy	Percentage
Could not do anything	40
Borrowed/begged for food	33
Borrowed money/asked for credit from food sellers	32
Worked for food	13
Collected from refuse dumps/bins	2
Other	16

Comparing their food security situation to the previous year, 54 percent of households felt that they were worse off now, 27 percent thought that their situation was about the same, and only 18 percent of households believed that their food security situation improved over the last year. Furthermore, 55 percent of all households indicated that the general food consumption had been less this year as compared to last year. Thus, based on the overall subjective perceptions in the survey, the extent of hunger increased over the preceding 12 months.

Lack of infrastructure

Apart from obvious handicaps such as lower education and skill levels (mostly a result of the appalling quality of schooling in rural and poor urban areas), the spatial isolation of most poor African inhabitants is an often forgotten barrier to employment. Forty percent of main breadwinners take more than an hour to get to work. Transport by train is the most common means of accessing work (42 percent), followed by taxi (17 percent) and bus transport (15 percent). For 60 percent of breadwinners, a return journey to work exceeds R20 (US\$3) per trip. A recent report found that the poor in Cape Town have to commute 16 km on average to get to work, compared with 12 km for the rich (Cape Town Metropolitan Council [CMC], 2002).

This factor reflects the inability of the city administration to instigate significant changes in the social and economic distribution across the city. Turok (2001) highlights how the pressure to become a global city that attracts foreign investment and tourism has severely limited progress towards urban integration. Despite an extensive and widely publicized process of identifying development nodes that are situated closer to the areas where there are concentrations of the poor, nearly all private investment has continued to flow to the richer suburbs. This is largely because of the reluctance and inability of local government to influence market forces – “the general implication is that income, social class and market forces have replaced race and state control in directing the pattern of urban development” (Turok, 2001, p. 2362). Cape Town has been hit hard by the lowering of tariffs, especially in the textile industry, with significant job losses. This is giving rise to an informal economy. In 1996 35 percent of economically active people were engaged in the sector but this had risen to 45 percent by 2001 (CMC, 2002).

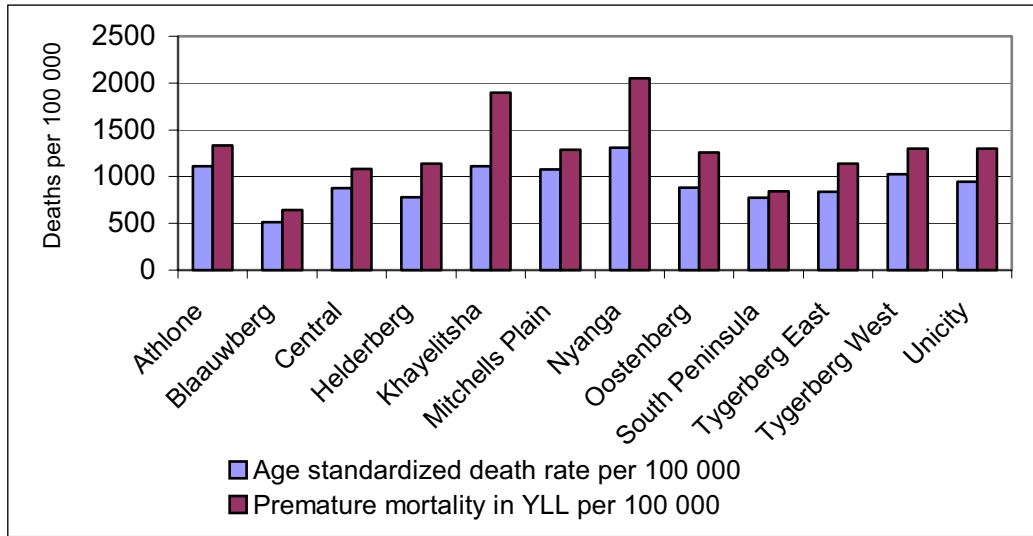
There is at present a backlog of about 220 000 housing units, which is increasing by 30 000-50 000 per annum (Cape Metropolitan Housing Task Team, 1999). Yet at the same time housing resources allocated by the central government to Cape Town are decreasing as it is deemed less needy than other provinces. Furthermore, Jenkins and Wilkinson (2001) show that the ability of public investment to offset this is being compromised by pressure to cut expenditure, especially in human resources. Often this is leading to the building of sports and community centres that remain closed because of a lack of personnel and operating costs. Finally, Smith and Hanson (2003) provide compelling evidence of how the pressure for local government to become more “entrepreneurial” is fostering partnerships with the private sector in the provision of basic services such as water and sanitation, and leading to increased lack of services in the poorer parts of the city because of non-payment.

The constricting ability of the state to respond to these needs is putting increasing pressure on land and social tensions. This is also restricting the ability of households to improve food security through home gardening. In the University of the Western Cape survey only 3 percent of households engage in home food gardening (grains and vegetables), and do so solely for their own use and not for trading or selling. Similarly, livestock ownership is rare among the households, with poultry being the highest percentage (11 percent). In the small number of households engaging in agricultural activities, there was no indication that garden cultivation and the possession of livestock significantly reduced the vulnerability of households to hunger. Most respondents stated that the severely limited spatial constraints, the unfertile soil and the perception that agriculture was an activity for rural and not urban dwellers were the main reasons for not growing food. Fear of crime was one of the most common complaints and with good reason. Cape Town has one of the highest murder rates in the world, nearly all concentrated in the poor townships.

Health patterns across the city

Total mortality varies across the city. The two districts with the highest concentration of poor African populations, Khayelitsha and Nyanga, have the greatest mortality. This difference is accentuated if we focus upon premature mortality as measured by years of life lost (YLL) (Figure 5). This is of particular interest to public health managers who work to avoid premature and preventable mortality. The average YLL in the city are 11 178 if Nyanga and Khayelitsha are excluded. This is almost half the premature mortality experienced by Nyanga (20 502) and Khayelitsha (18 974).

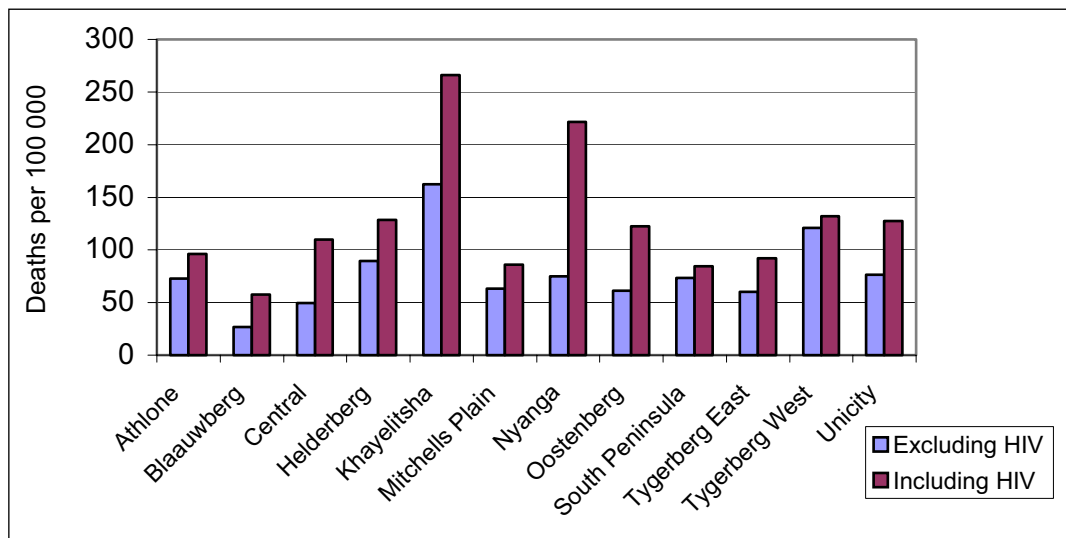
FIGURE 5
Premature mortality in YLL compared with age-standardized mortality rate



Source: Scott *et al.*, 2001.

To understand the causes of premature mortality better, a review of the distribution of causes of mortality in each subdistrict is helpful. It appears that the disproportionate burden of premature mortality in Nyanga and Khayelitsha is as a result of high levels of infectious disease, injuries, road traffic accidents and homicide (Figure 6). The age-standardized mortality rate (per 100 000) for infectious diseases is highest in Khayelitsha (266) and Nyanga (221) and lowest in Blaauwberg (58), South Peninsula (84) and Tygerberg East (92).

FIGURE 6
Age-standardized pretransitional (group 1) rate of mortality per 100 000 in 2001



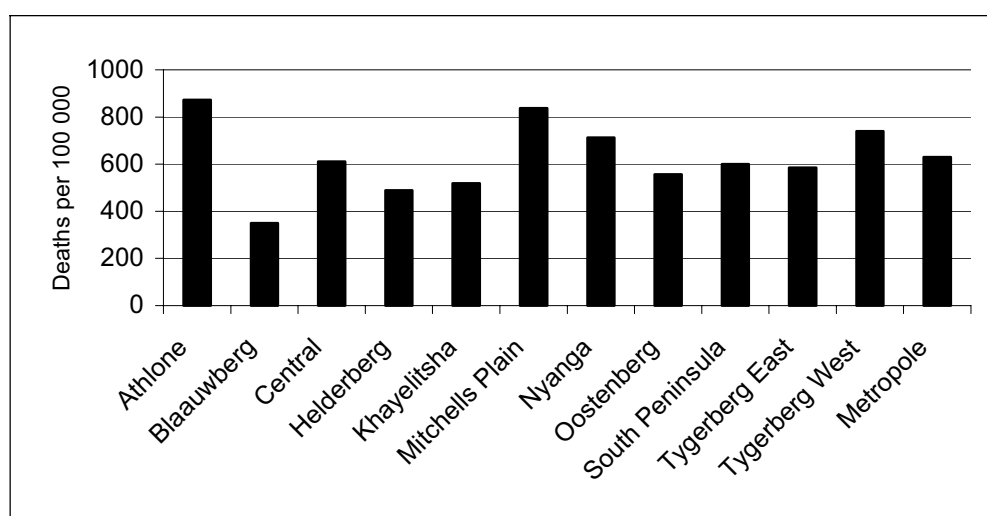
Source: Scott *et al.*, 2001.

The responsibility for addressing this inequity must rest firmly with the city, as the provider of basic services: water, sanitation and housing. Inadequate provision of water and sanitation is largely responsible for gastrointestinal infections and overcrowded

housing allows the spread of respiratory infections such as tuberculosis. Maternal deaths are preventable if there is access to a good-quality health service. The burden of HIV is once again borne predominantly by Khayelitsha and Nyanga.

A slightly different pattern emerges for mortality from non-communicable diseases (NCDs) (Figure 7). The levels remain high in the poorest districts but are overtaken by districts such as Athlone and Mitchells Plain that rank just above the poorest districts. This reflects the increased prevalence of risk factors such as hypertension, smoking and diabetes in these poor communities compared with wealthier districts.

FIGURE 7
Non-communicable age-standardized deaths per 100 000 persons in 2001



Source: Scott *et al.*, 2001.

Obesity and diet

In the University of the Western Cape survey 70 percent of women are overweight (with 24 percent overweight and 46 percent obese) and only 28 percent fall within the normal weight range. In line with the findings of the Demographic and Health Survey (DHS) (Puoane *et al.*, 2002) only about 20 percent of women actually perceived themselves to be overweight. More in-depth qualitative work with samples of obese women in the Cape Town townships has uncovered a complex array of factors influencing perceptions of body shape (Mvo, Dick and Steyn, 1999). On the one hand some younger women and those with higher levels of education are aware of, and aspire to, a slim body shape. However the majority of African women associate thinness with illness and now with HIV/AIDS. Being large is a sign of wealth and for men a sign that they can look after their families.

Dietary assessments and observations of preparation of food show that women in the townships are very adept at accumulating calories at relatively little financial cost. But their new environments and situations also mean a sharp reduction in physical activity for some. These points are highlighted in the example in Box 1.

BOX 1

Ecology of obesity (taken from Chopra and Puoane, 2003)

Zanempilo is an NGO providing primary health care and rehabilitation services in the urban townships of Cape Town. Community health workers (CHWs) were residents of Khayelitsha and shared the same sociocultural and demographic profiles as ordinary members of this community. As part of an initiative to address the problems of overweight and obesity, a participatory approach of assessment, analysis and action was used to collect baseline data from CHWs on barriers to healthy living, including risk factors, prevention and treatment of diabetes.

Of 44 CHWs measured, two were normal weight, two were overweight, 25 obese and 15 extremely obese. Most perceived moderately overweight women as attractive, associated with dignity, respect and confidence. Negative aspects were continuous body aches and tiredness. Photographs showed unhealthy food preparation and large portion sizes. Barriers to physical activity included fear of losing weight, personal safety and lack of exercising.

“I am scared of exercising because I will lose weight and people may think that I have HIV/AIDS.”

They also had a very limited knowledge about nutrition.

“People who boil food are not civilized. Fried food is attractive, tasty such as Kentucky fried chicken. If your neighbour boils food people say she is still backward because the food does not taste nor look attractive.”

“It’s quicker to fry food than to boil it. Fried meat is more tasty than boiled meat.”

However they also highlighted important environment factors.

“There is a shortage of healthy, low-fat food and little fresh fruit and few vegetables are available in the townships. The majority of local shops sell cheap fatty foods. Street vendors’ stalls sell fatty meat and sausages.”

“To drink low-fat milk is impractical because it is not available in our shops,” stated one of the CHWs after she had tried to cut down on the fat in her diet.

The combination of high unemployment and poverty, the continuing influx of rural migrants with low levels of resources and formal skills generate intense pressures for land, shelter and fuel. This in turn breeds rivalry and often conflict between groups and individuals as they attempt to cling on to territory and power (Moosa, 1998). The pervasive climate of fear and violence is another, but under-researched, factor in explaining dietary and lifestyle choices of people. The instant gratification of sweet and fried fatty foods can be succour for the hardships faced. And the legitimate fear of crime and violence restricts recreational opportunities especially after dark.

Responses

Despite the considerable constraints facing the state, there have been a number of interesting responses from the national, provincial and local government. Nationally there is recognition of the need to mitigate some of the “push” factors that are taking people out of the rural areas. A number of the poorest rural districts have been identified as “developmental nodes” that should be receiving extra infrastructural and human resources. To date there has been no evaluation of their success.

More locally, the Provincial Department of Health is working with its municipal counterparts to improve household food security in urban settings. In Cape Town for example, a team of five community nutrition officers dispense grants for totally more than US\$50 000 per annum supporting community garden projects (PAWC, 2002). With support, most of these gardens are now cooperating under the umbrella of three consortia, allowing them economies of scale and opportunities to share skills and ideas.

In most urban areas of South Africa there are also active NGOs and in some cases they are very sophisticated. Government is realizing that partnerships with civil society are going to be essential if they have any hope of addressing the development needs of South Africans. This is becoming especially acute with the increasing impact of HIV/AIDS. Box 2 is an illustration of a partnership between provincial and local government with local NGOs and research institutions.

BOX 2**Combating worm infestation**

Khayelitsha is the largest township in the Western Cape with an estimated population of 300 000. It is a mixture of formal and informal squatter communities. The high watertable, poor soil, low incomes and extreme overcrowding make sanitation and hygiene formidable challenges. Diarrhoea is the leading cause of death among young children. Following a request from a local medical officer, a survey to determine the prevalence of intestinal worms in primary schoolchildren was conducted in 1999. All 12 primary schools in Khayelitsha were sampled and over 1 200 children's stools examined. The results are astounding. Prevalence of whipworm (*Trichuris trichiura*) and roundworm (*Ascaris lumbricoides*) was estimated, respectively, as 80.3 percent (SD 9.5, SEM 2.7) and 69.7 percent (SD 9.2, SEM 2.6). In many schools nearly all the children examined were infested.

The initial action was to raise funds and deworm the children with medication. Anthelmintic treatment during 1999 reduced excretion of whipworm and roundworm eggs per gram of stool, respectively, by 85.4 percent (SD 15.7, SEM 4.7) and 98.6 percent (SD 2.4, SEM 0.7). The medical intervention was successful in reducing worm eggs from recycling to the environment in areas without sanitation. The interest generated by the deworming was used to engage parents and teachers in addressing the broader causes of infestation and undernutrition. This was done using techniques involving participatory approaches. A series of educational materials focusing upon hygiene and environmental improvement has been developed and integrated by the Department of Education into the curriculum. It also initiated a broader environmental intervention involving all role players. The Khayelitsha Task Team now comprises teachers, school nurses, city of Tygerberg officials, parents, the local university and NGOs. They are at present engaged in testing various "dry sanitation" options.

CONCLUSION

It should be quite clear that the new dispensation in South Africa has unleashed a number of forces that threaten to overwhelm the capacity of urban governments, services and communities to cope. Local agencies need to establish new ways of operating that are appropriate to addressing the new kinds of problems. A key priority is the formulation of policies that are based upon a more detailed understanding of the reality and dynamics of new urban poverty. What are the factors leading to the apparently contradictory emergence of obesity and poverty? What are the key strategies undertaken by urban households to attain household food security? What is the price paid by the most vulnerable members of the households in the livelihood choices made by households? This paper has attempted to illustrate some of the links between globalization, urbanization, local government capacity and policies, poverty and diet. There still remains much to be done.

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Impact of globalization on food consumption, health and nutrition in urban areas: a case study of Dar es Salaam, United Republic of Tanzania

Joyce Kinabo¹

INTRODUCTION

The United Republic of Tanzania, located in eastern Africa, has a total area of 945 087 m² (Figure 1). The climate varies from tropical along the coast to temperate in the highlands. Most of the United Republic of Tanzania lies more than 200 m above sea level. Mount Kilimanjaro rises to more than 5 000 m above sea level, the highest point in Africa. The country gained independence from British rule in 1963 and today is a growing multiparty democracy of 35 million citizens (National Bureau of Statistics, 2002).

FIGURE 1
Map of the United Republic of Tanzania



Source: CIA (Central Intelligence Agency) , 2004.

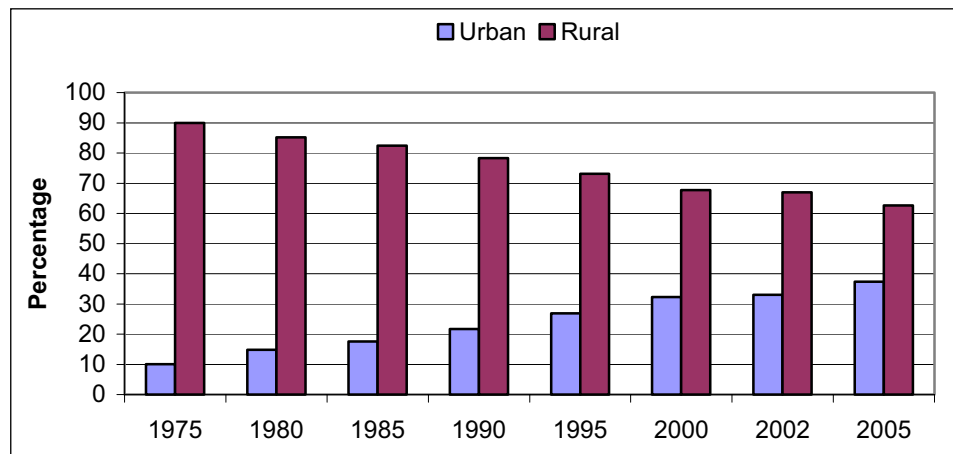
Socio-economic characteristics

The proportion of people living in urban areas has increased from less than 10 percent in 1975 to 33 percent in 2003 (Figure 2). The United Republic of Tanzania's rapid urbanization rate is

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among the highest in the world. As a result, pressure is placed on the capacity of urban services and on the growth of opportunities for gainful employment in and around the urban centre.

FIGURE 2
Trends of urbanization in the United Republic of Tanzania from 1975 to 2005

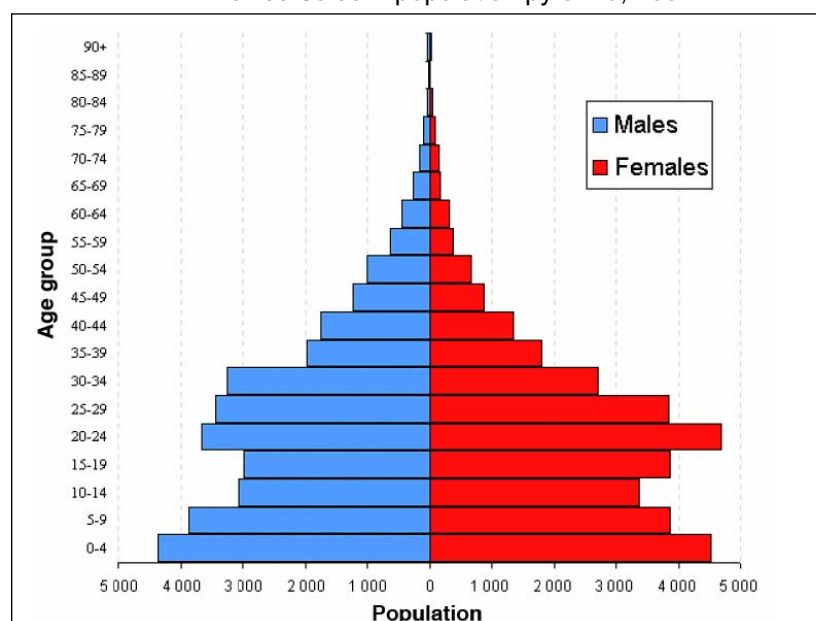


Source: National Bureau of Statistics, 2003.

The population structure of the United Republic of Tanzania shows that the proportion of children under 14 years of age is more than 48 percent and the elderly population (above 60 years) accounts for 6.1 percent. The dependency ratio increased from 98 percent in 1967 to 116 percent in 2002. This is indicative that the economic burden on persons in the reproductive age groups has not changed significantly over the last 30 years. The average life expectancy at birth is 51 years; total fertility rate is 5.2; the infant mortality rate is 104 per 1 000 live births; the under five mortality rate is 165 per 1 000 live births; and the maternal mortality rate is 530 per 100 000 (UNICEF, 2003).

The population structure of Dar es Salaam is shown in Figure 3. The population pyramid shows the age and sex structure of the population in five-year age groups.

FIGURE 3
Dar es Salaam population pyramid, 2001



Source: Ministry of Health (the United Republic of Tanzania), 2001.

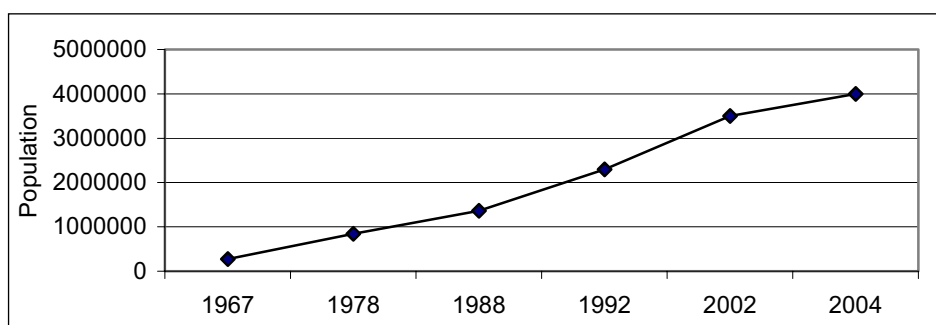
The United Republic of Tanzania has a mixed economy in which agriculture plays a dominant role. Agriculture contributes the largest share to the gross domestic product (GDP), which has been increasing since the early 1990s. It was 3.4 in 1991 and is currently 5.6. However, the contribution to GDP from agriculture has been declining from 48 percent in 1991 to 44.8 percent in 2002 (Research and Analysis Working Group, 2002). Currently, the urban labour force is 16.8 percent of the total labour force in the country.

Dar es Salaam

Dar es Salaam is located along the Indian Ocean and covers a total area of 139.3 km². Administratively, the city is divided into three municipalities – Kinondoni, Temeke and Ilala.

Dar es Salaam is the commercial city of the country and one of the fastest growing cities in Africa. It has a population of 3 497 940 (census, 2002) with an intercensal growth rate of 4.3 percent (1988-2002). The Dar es Salaam population (Figure 4) is fuelled partly by an influx of unemployed youth from the rural areas looking for better opportunities in urban areas. On average, 16 percent of the city population are migrants from other places in the United Republic of Tanzania who have migrated over the last six years.

FIGURE 4
Dar es Salaam population changes from 1967 to 2004



Note: the population figures for 1992 and 2004 are based on estimates.

Source: UNDP, 1998, 2003.

Urban livelihoods

The average income earner in Dar es Salaam is responsible for four people, which is a significant burden given the low level of earnings. Most workers are self-employed rather than wage earners. The majority of the poor are proprietors of small businesses and account for 20 to 40 percent, depending on the area of the city. Petty traders or street vendors are 15 to 20 percent and consist mainly of male youth between 20 and 29 years of age. Skilled workers account for 20 percent of the labour force. Unskilled labourers are 10 to 30 percent (Research and Analysis Working Group, 2002). Seasonal fluctuations in incomes leave many households throughout the city particularly vulnerable when food prices are high. However, the urban poor often maintain a link with their rural background either in the form of a plot or food remittances from time to time. This acts as a coping strategy when the situation gets harsh.

Urban living conditions

Problems facing the urban poor include rudimentary housing, an unhealthy environment and dilapidated physical infrastructure. Few families own houses in the dense areas of the city, where rents can be high. Few homes have indoor bathrooms and instead common pit latrines are used, which are poorly maintained. Hygiene practices are poor among the

urban residents, particularly in densely populated areas. Refuse disposal is ineffectual and what is not collected is usually dumped on the street. The situation is likely to worsen as the city becomes more congested.

Public services have deteriorated and private services are emerging but tend to be far less accessible to the poor because of high costs. Poor living conditions (overcrowding, poor housing, health, water facilities and services) leave the population more susceptible to diseases. Adequate health care is becoming increasingly inaccessible to the poor because of budgetary reduction in health services and the introduction of cost-sharing policies in the health sector. In addition, the urban poor tend to have a lower level of education than middle-income urban people; they have a low level of awareness on how to make use of health care facilities. This leads to a high incidences of disease, especially in children. Child malnutrition is a severe problem and about 40 percent of the children in Dar es Salaam are stunted (CARE the United Republic of Tanzania, 1998; IFPRI, 2001). High-income groups, however, tend to have access to all the basic services and facilities. But they suffer more from diseases of affluence.

INDICATORS OF GLOBALIZATION

Globalization is a complex process that involves political, economic and sociocultural changes across the globe (Lubbers and Koorevaar, 1999). It should be noted, however, that globalization is not a completely new phenomenon. It has existed since the time of exploration as people moved from one continent to another in search of land and commodities. This is evidenced in changes in European diets as a result of exploration (Washington, 1996), as new foods were being introduced in Europe from all over the world. At the end of the Second World War, the world was fragmented and divided into a number of poorly integrated and non-integrated groups. Therefore, there were clear boundaries with sovereign states and distinct national economies. Globalization therefore is manifested in a shift from a world of distinct national economies to a global economy in which production is internationalized and financial capital flows freely and instantly between countries (Tobin, 2000; Stiglitz, 2000; Lubbers and Koorevaar, 1999).

Features of globalization include shifts from distinct national economies to a global economy; internationalized production through transnational and worldwide companies; and free and instant financial capital flows between countries, multinational organizations and companies with vast economic power over states, resulting in a relative loss of control and power of the state to manage its national affairs. Improved telecommunications and the development of an electronic communication network such as the Internet have helped to overcome the barriers of physical distances. Indicators that are used to determine the influence of globalization include communication, transportation, banking systems and electronics. Essentially globalization has to do with the evolution of humanity: communication, science, technology and development.

Communications

Communications as used here include telecommunications and electronic communication and are related to information access. Access to information in Africa is scarce – one in every 5 000 people has access in electronic form (Raychaudhuri, 1999). The situation is worse in rural areas where the necessary facilities for accessing information are lacking. Access is increasing in urban areas but at a very slow rate and only for a small proportion of the population. On average, there are 142 radio sets and 23 televisions for 1 000 people (UNESCO and World Bank, 2002).

In the United Republic of Tanzania, a similar trend is observed. Immediately after independence and up to the early 1990s, the United Republic of Tanzania had one state-owned telephone company, one radio station, no television station in the mainland and one television station in Zanzibar. Table 1 gives some statistics regarding communication in the country. It should be noted, however, that most of the facilities are located in urban areas. This is because of the low development of telecommunications infrastructure in rural areas and exorbitant telephone tariffs charged to telephone subscribers.

TABLE 1
Information and communication statistics of the United Republic of Tanzania

Service	1990	1995	2000	2002
Telephone lines/1 000	3	3	5	5.3
Telephone lines in large cities/1 000			23	35
Mobile phones/1 000	0	0	5	8
Internet users/1 000	0	0	115	120
Mobile lines operators	0	0	0	4
Radio /1 000	141	280	290	356
Television/1 000	0	17	20	23
Personal computers	0		2.8	>2.8
Television stations	0	0	3	7
Radio stations	2	2	4	30
Internet service providers	0	0	6	13
Internet cafés	0	0	0	1 000+
Satellites	0	0	0	1

Source: UNESCO, 1996; UNESCO and World Bank, 2002; Mgaya, 2000.

The increasing trend in both the size and quality of services has been a result of investment by private companies in the sector. Trade liberalization policies led to an increase in the number of private companies and service providers (UNESCO, 1998; Mgaya, 2000). These are concentrated mainly in the towns and cities. The shortfall in rural areas is partly offset by the greater use of radio. At the current rate of 356 radios sets per 1 000 people, the use of radios in the United Republic of Tanzania is significantly above the average of 196 for sub-Saharan Africa (UNESCO and World Bank, 2002).

Despite huge improvements in terms of the numbers of various facilities, the infrastructure is still poorly developed. In addition, the cost of the Internet remains a strong deterrent to significant improvement in services. Although there are increased private sector ISPs, service provision has not improved significantly. This is because it is carried out through the government telephone company; its service is inadequate in terms of robustness, combined with low bandwidth, congestion and noisy lines. Consequently, some local service providers use ISPs in the United States and Europe, which makes the service very expensive. In urban areas, accessibility to information is hampered because of frequent electricity interruptions.

Information technology offers an opportunity to disseminate information to a wide population and therefore influence people's behaviour and practices. However, the language barrier prevents many people from understanding what is beamed on the Internet. Information available through information and communication technologies (ICT) is mainly in English, which the majority of rural and urban communities in the United

Republic of Tanzania cannot understand. In addition, there is a lack of local content on the Internet. In 1999, for example, Africa generated only 0.4 percent of global content. There is a marked shortage of relevant materials in local languages on the Internet that respond to the needs of users. In addition, the literacy and basic skills levels of the general population are low, so that accessibility also remains low. There is a clear link between the development of skills and gains in ICT. However, despite tremendous ICT gains, social gender inequality still exists. Already disadvantaged in access to education, credit and land, women are also marginalized in all areas of ICT.

Transportation

The country has a total 88 200 km of roads, from feeder roads to highways. Of these, 3 704 are paved with tarmac and 84 496 are unpaved. Only 12 percent of the roads are passable throughout the year. The rest are passable only during the dry season and partly impassable during the rainy season. This has a significant influence on the movement of people and commodities from one area to another. There are 3 569 km of railway lines running between Dar es Salaam and Kigoma, Dar es Salaam and Moshi and Dar es Salaam and Zambia. In addition, the country has 12 ports and 126 airports and airstrips.

Banking

Before 1991, the financial sector comprised only six state-owned banks, one large government insurance company and three government-owned pension funds. In 1991, parliament passed a new financial institution and banking act, which allowed for the establishment of private commercial banks, financial institutions and foreign bureaus.

Liberalization of the banking sector removed the monopoly of the state-owned banks and financial institutions by allowing participation of the private sector through privatization and/ or the establishment of new banks. This created competition and greater efficiency in the banking sector. Formation of the Dar es Salaam Stock Exchange paved the way for the increased role of the private sector in production as well as mobilization and utilization of domestic resources. Foreign banks led by Barclays, Standard Chartered, South Africa (ABSA and Stanbic) and Citibank now account for a third of the market. Currently, there are 21 commercial banks and 12 financial institutions.

ROLE OF GLOBALIZATION AND URBANIZATION ON DIETARY CHANGE

Globalization is influencing food habits and dietary patterns in many parts of Africa (and the world in general), especially in urban areas. It has increased free movement of processed foods and other commodities such as cooking oil, soft drinks, biscuits, cakes, sweets and chocolates and ready to eat foods. These have become readily available on the market and consumption has increased significantly in urban areas of Africa. The dietary intake pattern is now changing rapidly from a traditional diet of high carbohydrate, high fibre to one containing many manufactured, processed and non-traditional foods. This trend is accelerated by the increased rate of urbanization. Increased urbanization and changing food habits and lifestyles have created an additional burden of nutrition problems in Africa (WHO, 2003). For example, in 1930 there was no incidence of diabetes in Kenya, but by the late 1970s it had become common (Mwaluko *et al.*, 1991). This phenomenon occurs independently from socio-economic change (Popkin, 1994; Drewnowski and Popkin, 1997).

Nutritionists in Africa have to deal with different types of problems. One is undernutrition, most prevalent in rural areas and resulting from dietary deficiencies in energy and micronutrients combined with poor hygiene, poor sanitation and frequent

illness. The diets of the middle- and low-income urban populations are changing as they strive to consume more modern imported foods and fewer traditional ones, but they cannot afford an adequate diet because of poor accessibility (low incomes). These populations tend to have a high prevalence of micronutrient deficiency and some energy insufficiency. Other types of nutritional problems are mainly seen in the urban upper class, which has had a dramatic change in lifestyle and food habits. These people have increased their consumption of highly refined energy-dense foods (fats and sugar), meat and alcohol (Garine, 1969; Drewnowski and Popkin, 1997). Nutritional-related problems for this group include obesity, diabetes and cardiovascular diseases. Problems of overnutrition are also increasing in rural communities.

The analysis by Drewnowski and Popkin (1997) shows that there is a major shift in the structure of the global diet. The global availability of cheap vegetable oils and fats has resulted in increased fat consumption among low-income countries. As a result, the problems of dietary-related diseases occur at lower levels of the GNP than hitherto. This is also accelerated by urbanization. Those working to improve the nutritional well-being of the poor in developing countries are now confronted with an additional challenge on how to deal with the emerging crisis of excess nutrition and chronic dietary-related diseases without drawing resources away from the problems of undernutrition and poverty. It should be noted that the ultimate goal is to have adequate nutritional status for all populations irrespective of their economic status (rich or poor).

One of the opportunities of globalization and market liberalization is that it allows diet diversification. The traditional diets of Africa, and the United Republic of Tanzania in particular, are based on a very limited number of foods and often consist of more starchy roots and coarse grains, less fat and high fibre, and offer little in terms of diversity or variety. With the introduction of foods from other regions of the world, there is a shift from high carbohydrate staples to a more diverse diet, ensuring availability of more nutrients, even those that are known to be deficient in foods produced from the local soils. The movement of foods from one region to another allows exchange of nutrients between regions and helps to supplement or complement the missing nutrients in the local diets.

Evolution of urban food supply

Crop production data (Ministry of Agriculture and Food Security, 2003) show that the Dar es Salaam region can only attain 6 percent of its food sufficiency; therefore 94 percent of its food requirements are obtained from other regions and through imports from other countries. Limited production and trade liberalization paved the way for the proliferation of food-based investments such as supermarkets and food merchants, as evidenced by the food supply trend at Kariakoo market (Table 2) and from food imports data recorded by the Ministry of Agriculture and Food Security (2003).

TABLE 2
Food supply trend of fresh foods entering Dar es Salaam (tonnes)

Commodity	1999	2000	2001	2002	2003 (July)
Vegetables	161.8	26 390	32 939	39 645	23 774
Fruit	4 260	8 412	13 283	11 948	9 361
Fish	2 609	2 904	2 030	1 669	1 027
Roots and tubers	11 940	12 203	15 623	18 864	16 259

Note: the leap increase in vegetable supply at Kariakoo market is a result of poor record-keeping of the vegetable supply prior to 2000. In 2000 a private operator took up the market, which made an improvement.

Source: Mjawa, 2003, unpublished.

The supply of fresh foods, especially of fruit and vegetables, has been increasing annually since 1999 as a result of increased production and improved transportation, which have been brought about by globalization. Under globalization, many people are now free to produce and market their products anywhere in the country with minimum restrictions, unlike the period before liberalization. Similarly, imports have been increasing year after year. For example, in 1999/2000 importations of non-cereal products were 21 137 tonnes and increased to 221 258 tonnes in 2001/2002. However, importation of cereal products has been declining with time from 426 253 tonnes in 1999/2000 to 380 548 tonnes in 2001/2002. This could be attributed to higher prices charged on imported cereals compared to local ones. In addition, the taste of imported cereals is quite different from what people are accustomed to and therefore imported cereals serve just a small proportion of the population, mainly those of Asian origin. Total food imports have been increasing from 447 390 in 1999/2000 to 689 187 tonnes in 2002 simply because of the increasing importation of non-cereal food items such as oils, soft drinks, fruit and vegetables.

Street foods

Street foods account for 70 percent of the total calorie intake of the urban low- and middle-income groups. In a survey carried out in Dar es Salaam (Mjawa, 2003, unpublished), it was observed that on average 168 people visit one street food vendor per day. This was not the situation about 20 years ago. Take-away meals from street food vendors are also becoming very popular in urban areas (Nkurlu, 2000). Many households buy food from vendors to save on the cost of food ingredients and cooking fuel, save preparation time and try new foods. Men from low-income groups account for 70 percent of all consumers of street foods. Persons in the higher socio-economic groups tend to eat out in western-type fast food restaurants (such as Steers and Burger King).

The types of foods served by street food vendors include rice, stiff porridge from maize flour, plantains, and maize cooked with beans. Other foods include fried potato, cassava and sweet potato chips; roast and fried chicken; roast pork, beef and goat meat. Foods sold in western-type fast food restaurants include fried chicken, beef burgers, pizzas, potato chips and soft drinks. All these foods have high proportions of oil, salt and sugar and are therefore higher in calories than other foods.

Urbanization, coupled with low wages offered to employees and labourers, has led to a proliferation of street food vendors who offer commercial meals but with high microbial contaminants caused by poor hygiene and handling methods. Vendors' stalls are usually located outdoors or under a roof and are easily accessible from the street. They have low-cost seating facilities, which are sometimes rudimentary. Their marketing success depends exclusively on location and word of mouth promotion. Individuals or families usually

operate street food businesses, but benefits from their trade extend throughout the local economy. Vendors buy their fresh food locally, thus linking their enterprise directly with small-scale farms and gardens in the urban areas. These have partly contributed to the expansion of urban agriculture in Dar es Salaam (Christopher, Kinabo and Nyange, 1994).

With urbanization on the increase, street foods will tend to become even more important, hence there is a need for more research in this area in order to identify ways of improving preparation and handling of these foods.

Supermarkets

Supermarket growth in the United Republic of Tanzania took off in the 1990s and early 2000. In the 1980s, the state was in charge of public sector retail operations, regional trading companies and household supply companies. These were privatized in the 1990s when trade liberalization was taking place and were rapidly replaced by a proliferation of private minimarkets and small grocers in the mid-1990s. Currently, there are 11 supermarkets in Dar es Salaam, and these include two domestic chain supermarkets: Imalaseko and Shoppers' Plaza. About 80 percent of foods sold in supermarkets are imported, and only 20 percent originate from the United Republic of Tanzania. This small proportion is actually achieved through a regulation, which requires supermarkets to include local foodstuffs on their shelves. However, access by farmers to these supermarkets (either to sell or buy) is very limited.

Fast food chains

Up until the mid-1990s, multinational fast food chains had more or less ignored the East African market, especially the United Republic of Tanzania and Uganda, where the middle class, the target group, only recently began to develop a liking for fast food (Kaiza, 1999). The entry of fast food chains has stimulated a lot of business in urban areas, especially in Dar es Salaam. Currently, there is tremendous expansion of the major fast food companies in Africa such as Steers, Nandos and Innscor. In a period of four years, the food licensing board issued 35 new licences and 23 in 2002/2003 (Mjawa, 2003, unpublished). Fast food outlets serve only a few types of food, usually prepared by frying, e.g. hamburgers, chicken, potato chips and pizzas (Pan African News Agency, 2002). Some of these food items are imported. Owners, who in most cases are foreign investors, usually have a franchise arrangement with a transnational company, which also controls the provision of raw materials, the menu and mode of preparation, thus decreasing potential stimulation of local producers. The fast food chains do not offer much in terms of generating local production of the food items that are used in their recipes.

Increased consumption of fast foods especially among the young population is linked to increased marketing activity. Advertisements and sales promotions are playing a key role in expanding and stimulating demand among the younger generation. Such promotions increase purchase frequency by giving consumers an incentive, a gift or a prize, encouraging them to drink or eat more. Sales promotions drive frequent purchasing particularly among children. Promotions are carried out even in rural areas. It is common to find an advertisement for Coca-Cola in remote villages of the United Republic of Tanzania. This is a clear indication that the multinational corporations have penetrated the country so deeply that they have also influenced the pattern of consumption. Instead of drinking fruit juice or any other locally available natural beverage, many people have switched to drinking Coca-Cola and other soft drinks.

IMPACT OF GLOBALIZATION ON LIFESTYLE IN URBAN AREAS

Walking to and from work was commonplace in the 1980s and early 1990s when the importation of cars was restricted. In addition to less active commuting, there has been a significant reduction in physical activity at work and at home because of availability and ability to buy household labour-saving devices such as dishwashers, washing machines and vacuum cleaners, particularly for the high-income group. Women's workload in this group has diminished significantly. Even without these labour-saving appliances, high-income families can afford to hire several workers to help with the household chores, their leisure time has increased and this time is usually spent watching television, talking or reading but not engaging in demanding physical activity. The level of activity in other income and age groups is also low compared to that in rural areas. Consequently, obesity and cardiovascular diseases are on the increase. To alleviate this problem, people have been encouraged to incorporate physical exercise in their lifestyles. This has led to a proliferation of gyms and health or fitness clubs in Dar es Salaam. These facilities are not free, and serve only those who can afford access. Low-income groups, who also tend to be obese, cannot afford to use them.

Transportation systems

Increased importation of cars has improved the transport system in Dar es Salaam and in other urban areas of the country. In the early 1980s, the transport system was virtually collapsing. Movement of people and commodities was difficult and prices were high because of high transportation costs. Immediately after trade liberalization there was a huge influx of cars, mainly reconditioned ones from Japan and the Republic of Korea. Currently, most urban areas have public transport run by private individuals. The private transportation industry is something like the informal street food industry; even unskilled illiterate persons operate taxis or minibuses. The urban "public" transportation system is a collection of privately owned cars operating as buses and taxis. There is a state-owned company, but it is on the verge of collapse. Traffic is worsening in cities, particularly in Dar es Salaam. The increased number of cars has also contributed to environmental pollution.

Crime

Crime rates have increased significantly over the past 20 years. The most prevalent crime is burglary with about 43 percent of households reporting being burgled over the last five years. Simple theft is the second most frequent crime. Theft of livestock and crops is common in the rural areas of the city. Hijacking and vehicle theft rates are very low, but theft of external motor vehicle fittings is common. This has been experienced by 19 percent of the people surveyed. There are also high (16 percent) levels of assault. The rates of violent crime in Dar es Salaam and other urban areas of the country are lower than those found in other cities such as Durban where similar studies have been carried out (Robertshaw, Louw and Matni, 2000). Increased crime rates are a result of unemployment and lack of alternative income-generating activities in both rural and urban areas. Because of the increased cost of living and changing lifestyles, those without employment resort to burglary as a means of raising income.

Alcohol and smoking consumption

Alcohol consumption

Production of bottled beer has gone up greatly in the last few years. Beer is much more available now than it was in the early 1990s, with production increases from 529 955 hectolitres in 1988 to 1 221 307 hectolitres in 1996, 1 865 000 in 2001 and a slight decline

to 1 804 000 in 2002 (Barth and Sohn, 2003). However, because the cost of living has been increasing, people buy less beer now than before although they have more varieties from which to choose. The average per capita consumption is 0.6 litres – about 10 percent of that in Europe – and accounts for 20 percent of total beer production in the country. However, this does not mean that people in the United Republic of Tanzania do not drink. Small local producers produce 80 percent of the alcohol consumed in the country (Alcohol in East Africa, 2000). In Dar es Salaam, the common local brew is made from palm sap and is very popular during traditional ceremonies.

Drinking patterns have changed significantly. Most of the alcohol made in the past was not for sale. People drank for rituals and in social settings (ceremonial), and only elderly men were allowed to drink, not women and younger men. Today, drinking has become commercialized and people drink without a purpose.

This change in the pattern of alcohol consumption has had both positive and negative consequences. On the one hand, it has opened up an avenue for women to generate income. As a result, most producers of local brews are women. This is an example of a self-driven, sustainable and community-based enterprise which, if improved, could benefit women and their families.

However, on the negative side, alcohol consumption is depleting the meagre resources of the household. Women and children become the victims when household resources cannot cover their general health or schooling expenses. There is a need to conduct a study to establish the proportion of household income spent on alcohol and how this affects the well-being of household members.

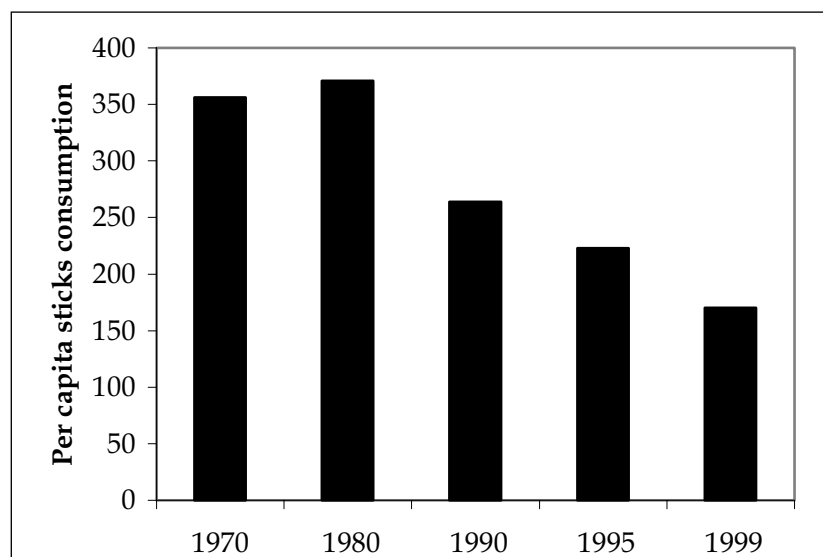
Smoking

There are no validated comparable population-based data available to indicate the trend of smoking in the United Republic of Tanzania (Jagoe *et al.*, 2002). Information about smoking or tobacco use in the United Republic of Tanzania is sparse and is based on scattered surveys mainly carried out in urban areas. In addition, most of the studies on smoking or tobacco use have focused on occupational or other selected groups such as hospital patients.

In Dar es Salaam, the prevalence of smoking is 27 percent for men and 5 percent for women (Jagoe *et al.*, 2002). The prevalence of smoking in adolescent males is 12.6 percent, but they have higher rates of inhalation of solvents (17.5 percent) compared to their counterparts in Harare (8.5 percent) and Cape Town (5.9 percent). The main reason is that the United Republic of Tanzanian youth have less income at their disposal and therefore cannot afford to buy alcohol. Consequently they resort to alternatives. Smoking is more common in males than in females. However, increased marketing activities of tobacco companies are targeting females, especially in urban areas. As many cultural prohibitions on women are easing with the effects of globalization, women are at high risk as regards increases in smoking.

Figure 5 shows that overall per capita cigarette consumption has been declining since 1970. It is currently at 170 sticks per annum despite increased production and the availability of cigarettes. The reason for the decrease is not clear but could be related to health campaigns that have been going on over the last two decades.

FIGURE 5
Annual per capita cigarette consumption in the United Republic of Tanzania, 1970-1999



Source: Jagoe *et al.*, 2002.

The changing role of women and impact on child care and feeding

Since the late 1970s, there has been a rapid rise in the number of female employees. Between 1977 and 1984 the number in the public sector rose by 200 percent (Tripp, 1992). Self-employment has been a more important type of income-earning activity for women than wage employment. Since the 1990s even more women have joined the informal sector. This is also observed in rural areas where non-farming activities have become important elements of the household survival strategy. Participation of women in the informal sector has given them more independence but has also increased their responsibilities for providing a cash income while maintaining their traditional role in the family.

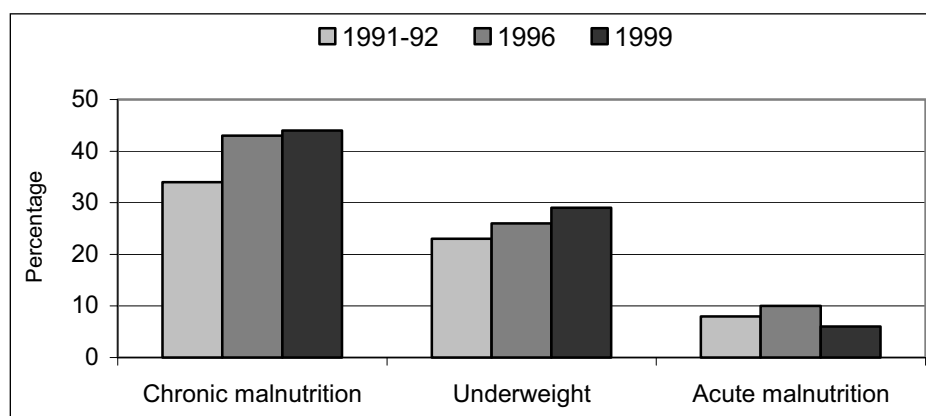
Both the prevalence and duration of breastfeeding have declined in most urban areas (National Bureau of Statistics, 2000; Popkin and Bisgrove, 1998). Less breastfeeding and earlier weaning in urban populations contribute to earlier faltering of growth (Atkinson, 1992). Other influences in urban areas that contribute to breastfeeding decisions are the increased promotion and availability of infant formulas. Globalization has caused an increase in the importation of foods, including breastmilk substitutes. In addition, the presence of marketing activities may have caused a switch from breastfeeding to formula feeding by the educated and a switch from breastfeeding to feeding other commercial breastmilk substitutes by uneducated mothers. Such behaviour is considered trendy and prestigious.

PREVALENCE OF MALNUTRITION IN URBAN AREAS

Trends for children

Based on the Health Statistics Report (1995), the 1991/92 and 1996 the United Republic of Tanzania Demographic and Health Surveys, and the 1999 the United Republic of Tanzania Reproductive and Child Health survey data, the trend of malnutrition as indicated by underweight, and acute and chronic malnutrition has been increasing in Dar es Salaam and other urban areas of the United Republic of Tanzania. Underweight increased from 23 percent in 1991/92 to 26 percent in 1996 and 28.7 percent in 1999 (Figure 6).

FIGURE 6
Trend of nutritional status of children in Dar es Salaam



Source: National Bureau of Statistics, 1997b and 2000.

The proportion of children with chronic malnutrition increased from 34.4 percent in 1991/92 to 43.8 percent in 1999. In a recent study conducted in Dar es Salaam, it was observed that the rate of chronic malnutrition increased to 47.6 percent (Rashid, 2003, unpublished). The prevalence of wasting declined from 9.6 in 1996 to 5.9 percent in 1999.

These results indicate that stunting and underweight are major nutritional problems in Dar es Salaam. This, however, does not reflect the trend of GDP, one of the indicators of the performance of the economy, which has been increasing during the same period. GDP was US\$5.0 billion in 1991 and increased to \$9.1 billion in 2000. GDP per capita has also been increasing from 0.6 in 1991 to 3.0 in 2000. Per capita income is often used as a proxy indicator of nutritional status. Countries with high GDP also tend to have fewer problems with undernutrition, suggesting a strong link between the strength of the economy and the well-being of the people. However, this is not the case for Dar es Salaam, because indicators of nutritional status in children have been worsening despite increased per capita GDP. This suggests two things: increased income inequality among Dar es Salaam residents and increased unemployment, poor living conditions and inaccessibility to health and water facilities and services. Reduced budgets on health, water and education – typical features of globalization – coupled with increased population may explain the deteriorating trend in the city. The deteriorating nutritional status could also be a result of the high prevalence of HIV/AIDS and other infectious diseases such as malaria and diarrhoeal diseases. It could also be because of reduced time for child care as more parents engage in income-generating activities to raise household incomes.

Trends for adults

There has never been any systematic assessment of the nutritional status of adults in the United Republic of Tanzania. However, results from various studies (Rweyendera, 1993, unpublished; Kitange, 2000; Rashid, 2003, unpublished) have shown that overweight and obesity are increasing among the urban population. Females in the low-income group are more affected than males, while in the higher-income groups males are more affected than females. In Dar es Salaam overweight and obesity were observed mainly in low-income group women above 40 years of age (Rashid, 2003, unpublished). Women in this age category tend to perform fewer physical activities; they are engaged in light activities such as weaving, fishmongering and street food vending.

In the United Republic of Tanzania, overweight and obesity among women are considered attractive. In the past, the man with the fattest wife was highly respected because he had the most beautiful wife (Maletnlema, 2002). Overweight and obesity in men are signs of wealth and command high status in the society. Slimness among adults was never admired and it is currently associated with HIV/AIDS. People now prefer increased body fat to avoid being suspected of having AIDS. This has contributed to the prevalence of overweight and obesity among the adult population, especially in urban areas.

Kitange (2000) observed that about 58 percent of the population in Dar es Salaam had a low body mass index (BMI ≤ 20). The results showed that males were more affected than females, especially among the low-income groups. This is contrary to the conventional belief that women are usually more vulnerable and therefore more affected than males. The situation is not different for the adolescent group; males in urban areas tend to have a lower BMI than females (Kitange, 2000).

Micronutrient deficiencies

The common micronutrient deficiencies of public health significance in the United Republic of Tanzania are vitamin A, iron and iodine. Iodine deficiency is not very common in Dar es Salaam since most people consume seafood, which contains significant amounts of iodine. The most widespread micronutrient problem is iron deficiency anaemia. Prevalence of anaemia in Dar es Salaam is 80 percent in males and 74 percent in females (Rashid, 2003, unpublished). Causes of anaemia in Dar es Salaam include the high prevalence of malaria, hookworms (Mwaluko, *et al.*, 1991) and a low intake of foods rich in iron, such as green leafy vegetables and animal source foods.

TRENDS IN HEALTH STATUS IN URBAN AREAS/ENVIRONMENT

Infectious diseases – HIV/AIDS and tuberculosis

In the United Republic of Tanzania, the HIV epidemic began in the early 1980s. A steady increase in infection levels among pregnant women occurred up through the mid-1990s. There is some evidence of a decline in recent years (UNAIDS, 2000), although the epidemic remains a serious problem. Females are infected at younger ages than males and rural areas are less affected than urban areas. Since the mid-1990s, HIV seroprevalence among pregnant women in Dar es Salaam has remained at around 14 percent. In 1998, prevalence levels among female blood donors in Dar es Salaam were 32 percent. Female clinic patients suffering from sexually transmitted diseases (STDs) in Dar es Salaam had generally higher HIV seroprevalence levels than male patients. HIV-1 seroprevalence among female STD patients in Dar es Salaam has been fluctuating between 20 and 40 percent from 1988 to 1997. The Republic of Tanzania has a cumulative total of 660 000 AIDS cases and a prevalence of 7.8 percent since 1983 when the first AIDS cases were diagnosed in the country. Male and females are equally affected but the peak number of AIDS cases in females is at the age of 25 to 29 years, while most affected males are aged 30 to 34.

Non-communicable diseases (NCDs)

NCDs are already a major health problem for adults in the poorest countries of the world. Demographic data show that age-specific death rates from NCDs in the United Republic of Tanzania are higher than in wealthier countries (Kitange *et al.*, 1993). Mortality rates for some NCDs, such as strokes, are particularly high. However, while NCDs account for 80 percent of adult deaths in developed regions, the figure is less than 30 percent in the United

Republic of Tanzania, reflecting the continuing burden of infectious diseases. Thus, the United Republic of Tanzania suffers the “worst of both worlds” (World Bank, 2002). The prevalence of some NCDs and their associated risk factors in the United Republic of Tanzania are shown in Table 3.

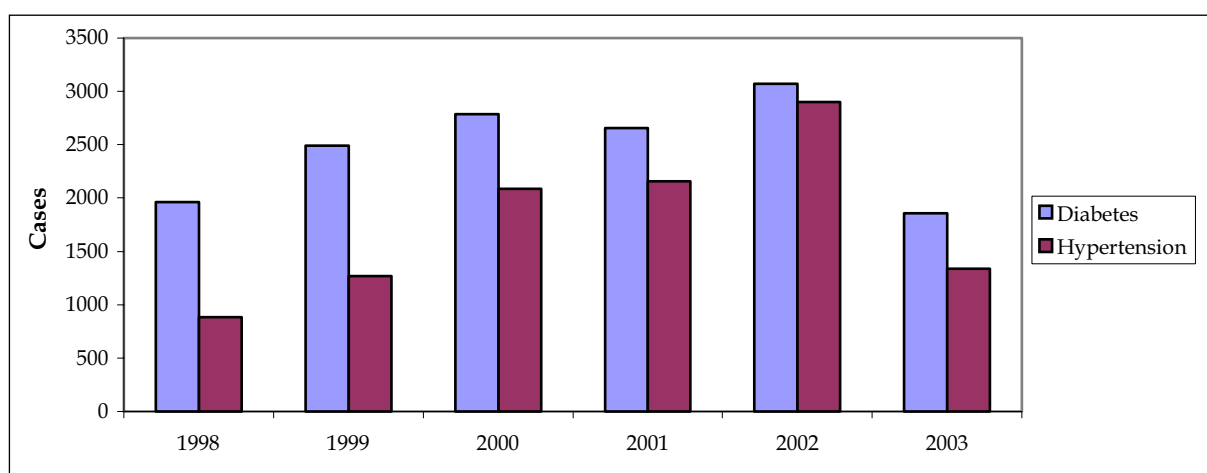
TABLE 3
Prevalence of some NCDs and their associated risk factors

Disease	Prevalence (percentage)		
	Male	Female	All
Hypertension	2.6-10.5	3.4-14.6	3.0-12.8
Diabetes mellitus	0.6-1.7	0.5-0.8	0.6-1.1
Obesity	0.1-2.1	0.8-10.6	0.7-6.6
Cigarette smoking	8.6-42.0	1.3-3.9	5.4-16.9
Alcohol drinking	12.2-77.8	4.1-75.6	7.8-76.1
High cholesterol	0.4-7.1	0.8-8.2	0.6-7.8
High triglycerides	8.1-16.4	7.7-11.8	7.9-13.2

Source: Kitange, 2000.

Diabetes places a severe strain on the limited resources of developing countries. In the United Republic of Tanzania, the average annual direct cost of diabetes care in 1990 was \$280 per patient requiring insulin and \$130 for a patient not requiring it. However, with implementation of the cost-sharing policy on health services, diabetic patients now have to bear an increasingly large share of the cost of treatment. It is likely that this will be reflected in a higher level of morbidity and mortality in the diabetic population. The increase in NCDs creates an enormous strain on the health budget.

FIGURE 7
Trends of common NCDs in Dar es Salaam over the past five years



Source: Kitange, 2000; Rashid, 2003, unpublished.

PROGRAMMES THAT HAVE TRIED TO ADDRESS FOOD AND NUTRITION ISSUES

Broad programmes

Reduction of economic inequalities

Reduction of economic inequalities was implemented through regulating wages by a progressive taxation system, the introduction of subsidies for production inputs for farmers, some basic food subsidies and price control. However, the situation changed after the introduction of economic reform programmes in the early 1980s. Subsidies have been removed, and liberalization of the economy has resulted in cessation of control over prices. The market forces now determine prices. Downsizing of the civil service and the public sectors has reduced considerably the purchasing power of most people. This may have a significant influence on their nutritional status. An analysis is needed to establish the extent of the influence of these reforms.

Food security for all

In the 1970s food security for all meant food sufficiency. Relevant programmes included the National Strategic Food Reserve, Early Warning System, the National Maize and National Food Strategy and Comprehensive Food Security. The impact of the programmes was reflected in increased food production. However, this did not correspond with improvements in health or nutrition. The infant mortality rate remained high even in regions with good food supplies. This suggested that apart from food supply alone, there could be other factors responsible for the nutritional status of the people. In this regard, food supply alone was seen to be insufficient to ensure good nutrition.

Provision of social services

the United Republic of Tanzania adopted a policy of providing free social services to all as a right. The provision of clean water, and health, sanitation and education services was free for all citizens. Among other things, this policy contributed to improved nutrition during the late 1970s and 1980s. However, economic strategies have changed and so have the policies. Now there is an element of cost-sharing in all public services and full costs for private services. Evidently, this is a constraint to vulnerable groups of society, including resource-poor households.

Free services are still provided for programmes such as maternal and child health clinics and childhood immunization. In addition, the Primary Health Care Programme under the health sector emphasizes health education, promotion of food supply and basic sanitation – elements that are key to the prevention of most communicable diseases. Other programmes include the Essential Drugs Programme, Control of Infectious Diseases, Hygiene Education and Sanitation and School Health and Nutrition.

Despite all efforts to improve the situation, achievements have been limited because of a number of factors. One of these is the perception of nutrition issues at national and individual levels. At the national level, nutrition issues have been perceived to belong only to the health and agriculture sectors – the health sector, because of the diseases that arise through undernutrition, and the agricultural sector because it deals with food production. At the individual level, people do not appreciate the link between food and disease and perceive illness as a purely medical problem. The current climate of misperception calls for advocacy and lobbying to change the awareness of individuals and that of decision-makers at the national level with regard to nutrition issues. To ensure success in nutrition improvement there is a need for solid multisector collaboration and articulation of broad-based policies, since it is now recognized that nutrition issues cannot be addressed by the

health and agriculture sectors alone. This will also ensure inclusion of nutrition considerations in other sectors of the economy.

Specific nutrition intervention programmes

Specific interventions to reduce malnutrition have included both supplementation and food fortification programmes. Dietary supplements of vitamin A and iodine have been provided and salt has been used as a food vehicle for iodine.

One of the contributing factors to poor nutrition in the United Republic of Tanzania is lack of dietary diversification. Diets are monotonous and consist of very few items. They are composed of one staple and one type of relish – legumes, meat, fish or vegetables. A typical meal consists of only two dishes. Fruit is not consumed during meal times. It is considered to be a snack and therefore not very important. This is unfortunate because it is well known that there are complementarities in the supply and utilization of nutrients.

Thus, it is imperative that efforts be made as follows.

- Encourage diet diversification to increase the amount and variety of nutrients. This is necessary because nutrients tend to interact in function and utilization in the body.
- Develop food and nutrition guidelines based on the types of foods available in the country (if possible local areas) and provide information regarding the nutrient content of the different foods to allow people to make informed decisions on food choices.
- Develop recipes that are simple to prepare, using indigenous foods. This is crucial because sometimes people fail to use certain foods, which are not familiar, simply because they do not know how to prepare or cook them. Development of recipes would enhance and probably help to increase diet diversification.
- Provide nutrition education as an important tool in giving people access to knowledge and information to help improve their nutritional status and health. Nutrition education, particularly for girls and women, on food preparation, proper hygienic practices and nutrient requirements of different age groups would build up their capacity as mothers and caretakers of large families.

Sectors that need to come together to address the problems effectively

Local government authorities at the level of individual, family and community

- Provide nutritional education, particularly for women and girls.
- Provide adequate knowledge on the HIV/AIDS pandemic and encourage HIV-positive individuals to eat well.
- Encourage individuals to reduce the use of tobacco and introduce community-based interventions that discourage its use.

At the level of the Ministry of Health and health research institutions

- Initiate educational and research programmes on nutrition in primary and secondary schools.
- Determine the magnitude of the burden of poor nutrition and all possible risk factors.
- Carry out controlled studies to develop targeted and effective prevention methods.

At the level of sectors other than that of health

- Develop policies that will improve the agricultural sector, the roads sector and the food processing industry.
- Create an environment conducive to investment in the agro-based and food processing industry.

At the level of government, i.e. macroeconomic policies

- Strengthen the capacity of relevant research and development institutions and universities so that they can generate and package information regarding food and nutrition in the country for the purpose of improving the nutritional status of the people. Much-needed information includes the nutrient composition of foods and nutritional requirements of people living in disease-prone areas.

CONCLUSION

Poverty and food and nutrition insecurity are increasing in urban areas, partly as a result of global policies, which seem to affect people's behaviour and practices with regard to access to food and food choices. Globalization is influencing people's incomes and livelihoods and consequently their access to the necessary public services. It also influences diets and disease patterns. Problems arising through undernutrition and overnutrition are increasing. This has created an additional burden on the health systems of Africa.

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Trends in health and nutrition indicators in the urban slums of three cities in Bangladesh, compared to its rural areas

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INTRODUCTION ²

Since independence in 1971, Bangladesh has made considerable economic and social progress. Economic growth has accelerated, life expectancy has risen, the fertility rate has fallen, school enrolment has increased and child mortality and undernutrition have declined (BIDS/UNDP, 2001; Helen Keller International [HKI]/Institute of Public Health Nutrition [IPHN, 2001]). But despite these encouraging trends, about half of the people in Bangladesh continue to live in poverty and many millions of children are malnourished (HKI/IPHN, 2002) – clear signs that the country still faces great challenges in development.

As many countries experience similar problems, in September 2000 world leaders adopted the United Nations Millennium Declaration, committing their nations to stronger global efforts to reduce poverty, improve health and promote peace, human rights and environmental sustainability (UNDP, 2003). Enshrined in the Declaration were eight specific goals, referred to as the Millennium Development Goals (MDGs). These were: i) eradicate extreme poverty and hunger; ii) achieve universal primary education; iii) promote gender equality and empower women; iv) reduce child mortality; v) improve maternal health; vi) combat HIV/AIDS, malaria and other diseases; vii) ensure environmental sustainability; and viii) develop a global partnership for development. These goals reflect the international community's recognition of and commitment to a broader development agenda that encompasses economics, food security, education, health, the environment and global cooperation.

However, it must be recognized that development is contextual and what may work in one setting may not work in another. The recognition that each country must pursue a development strategy that meets its specific needs should be the starting-point of any attempt to attain the MDGs. For example, the transfer of people and economic activity from rural to urban areas is the most remarkable difference between Asia today and three decades ago (Ruel and Haddad, 2001) and urbanization will continue to change the face of

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the Asia-Pacific Region, along with its benefits and its ills. According to the United Nations Development Programme (UNDP), by 2015 half of Asia's population will live in cities and will number over a billion (Asian Development Bank, 2001). The region's megacities are becoming larger and there will be a tremendous increase in the urban poor population. The challenges in achieving the MDGs in urban areas are even more complicated as there is very little experience with this phenomenon.

In the case of Bangladesh, 30 million people, over 20 percent of its population, live in urban areas. The capital, Dhaka, has a population of more than 9 million people and the Asian Development Bank reports that Dhaka is one of the fastest growing urban areas in Asia, with an estimated population of 20 million by 2015. This rapid growth of the urban population in Bangladesh is accompanied by increasing poverty, food insecurity and malnutrition, and has serious implications for the welfare and well-being of the country's urban population. Increasing numbers of people living in urban areas put high pressure on development activities in urban slum areas that are home for millions of people in Bangladesh. Appalling living conditions created by poverty, an unsafe environment and poor hygienic conditions combined with a poor-quality diet aggravate the nutrition and health status of the urban poor population.

Country strategies need to be based on timely data from proper monitoring and evaluation systems that can capture as accurate a picture of the country's situation as possible. Helen Keller International has always placed great emphasis on monitoring and evaluation; since 1990, the agency has developed nutritional surveillance and data collection systems in Bangladesh, Viet Nam, Cambodia and Indonesia (HKI, 2001; HKI/Indonesia, 2000). These surveillance systems have led to a much greater understanding of the interdependence of the various causes of undernutrition.

To gain a better insight into the problems of urbanization in Bangladesh, this paper will look at differences in trends of health and nutrition indicators between the urban and rural populations of Bangladesh from 1990 to 2000. The data were collected through the Nutritional Surveillance Project (NSP), jointly implemented by HKI and IPHN in Bangladesh.

STUDY AREA

Bangladesh, a country with a predominantly Muslim population, lies in the tropical region, in the southern part of Asia. With a geographic area of 147 570 km², and an estimated population of 131 270 000 in 2001, Bangladesh is one of the most densely populated countries in the world.

The latest published data from the Bangladesh census (1991) indicate that 79.9 percent of the population reside in rural areas, while the remaining one-fifth live in urban areas (Bangladesh Bureau of Statistics, 1994). Data from the 2001 census have not been released yet, but the urban population will probably account for 26 percent of the total population and this figure will increase to 37 percent by the year 2015 (World Bank, 1985).

METHODS

The data used in this analysis were collected by the NSP to guide policies and programmes to improve health and nutrition in Bangladesh and contribute to a greater understanding of related factors, which could also be useful for other developing countries. The NSP was established in 1990 by HKI and IPHN, and between 1990 and 2000 it was implemented in collaboration with 34 non-governmental organizations (NGOs) (Bloem *et al.*, 1994). Data

were collected every two months by IPHN and partner NGOs, with training, field supervision, quality control, and data management and analyses conducted by HKI.

Between 1990 and 1997 a multistage random cluster sampling design was used to choose 240-260 children every two months from each purposively selected rural subdistrict ($n=30-40$) that was either vulnerable to natural disasters or representative of one of the six divisions of Bangladesh (total number of households sampled per round was 6 200 to 14 700). No data were collected between August and January 1997 because the NSP conducted a national vitamin A survey during this period. In February 1998, a stratified multistage cluster sampling design was introduced to provide data that were statistically representative at divisional and national levels. In each round, data were collected from 300 households in four subdistricts in each of the six divisions of the country. In 2000, the sample size in the subdistricts was increased to 375 households. In this way, the total sample size in each round of data collection was increased from 7 400 to 9 000 households.

Since 1990, the NSP has also collected data from four urban poor sites every two months. Of these four sites, two were in Dhaka, one in Chittagong and one in Khulna. In urban areas, households were selected from NGO working areas in the urban slums. Using a convenience sampling procedure, 700 households were selected from the Dhaka slum sites and at least 350 households from the Chittagong slum site. A systematic procedure was used to select at least 350 households from the Khulna slum site. Although urban sampling varied between sites, it was consistent over rounds.

A household was eligible for inclusion if it had at least one physically able child under five years of age and if the mother was present. A structured questionnaire was applied to collect data on children's and mothers' nutrition and health status, health and dietary practices and household demography, socio-economic status and distress, agricultural practices and food prices at village level; anthropometric measurements were taken from children under five years and from their mothers. About 10 percent of the households were revisited on the following day for quality control on selected indicators.

Data cleaning and analysis were carried out by HKI and for this paper data were analysed using SPSS version 11.0.

A more detailed description of the methods applied by the NSP can be found in Bloem, Moench-Pfanner and Panagides, 2003.

CHILD HEALTH AND NUTRITIONAL STATUS

Stunting (low height-for-age) is considered a good indicator of poverty since it reflects the health and nutritional status of the child over a longer period of time, and even of the mother during pregnancy. Figure 1 shows that the prevalence of stunting ranged from 68 to 76 percent during the early 1990s and decreased to 49-58 percent in 2000. It also shows that stunting has always been more prevalent among urban poor children, compared to rural children, and that the difference in stunting levels between the two groups of children has increased over time. This may be related to migration of the poorer families from rural to urban areas.

Figure 2 shows that the consumption of grain (largely rice) decreased between 1990 and 2000, which most likely indicates that the diet has become more diversified, because nutritional status did not worsen during this period (see Figure 1). Among the rural population, grain intake is approximately 20 percent higher than among the urban poor (3.0 kg/per capita/seven days as against 2.4 kg/per capita/seven days in 2000). While this may indicate that the diet of the urban poor is more diversified than that of the rural population, it may also partly reflect a higher energy intake among the rural population. The decline

from 1990 to 2000 was greater in rural sites, so diets appear to have diversified relatively more in the rural than in the urban poor areas.

While the prevalence of stunting has clearly declined, both among rural as well as urban poor children (Figure 1), the prevalence of wasting (low weight-for-height) among urban poor children in the three cities did not change much during the period 1990-2000 (Figure 3). There was a seasonal fluctuation for wasting, and the prevalence in Dhaka was somewhat lower than in Khulna and Chittagong. Wasting among Bangladeshi children fluctuates in relation to the different seasons in Bangladesh. From November to February, there are many cereals and vegetables available from production, a time that coincides with a low prevalence of child wasting. From the onset of the dry season in March up to the beginning of the main harvest (October) the prevalence of child wasting is higher. For diarrhoea however, the prevalence gradually declined during the period 1990-2000, especially in Khulna and Chittagong (Figure 4). This may largely be attributed to improvements in sanitation facilities.

FIGURE 1
The prevalence of stunting (height-for-age Z-score <-2 SD) among 6-59 months old children in urban poor and rural areas during the period 1990-2000 (urban n=107 568, rural n=562 489)

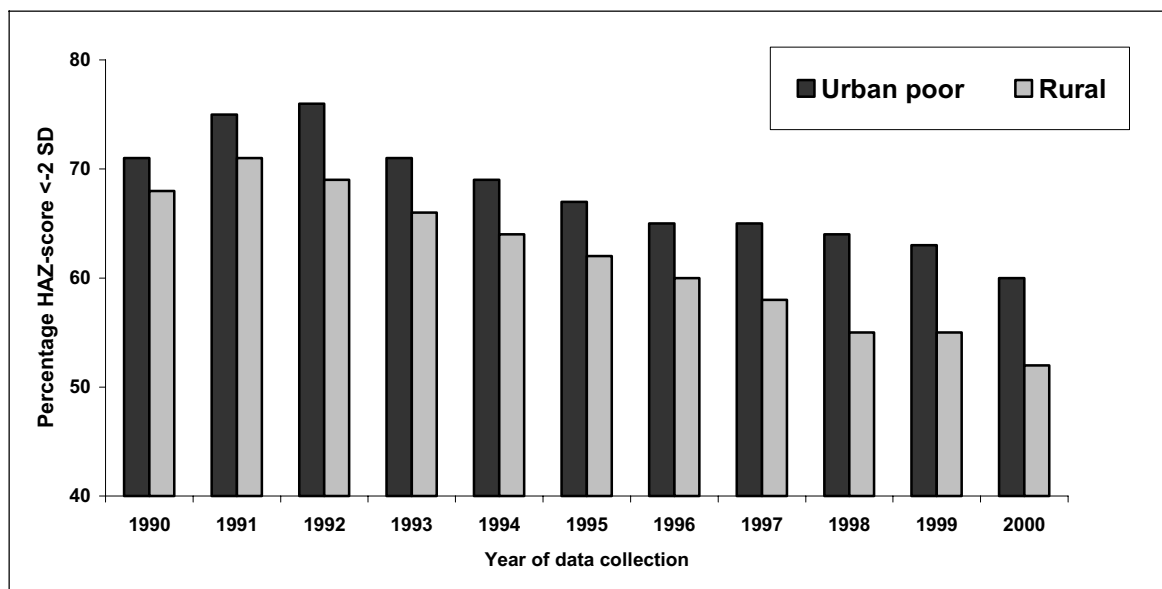


FIGURE 2
Intake of grain (rice, wheat, etc.) per household member during the previous seven days (kg) in urban poor and rural populations during the period 1990-2000 (urban n=77 521, rural n=418 311)

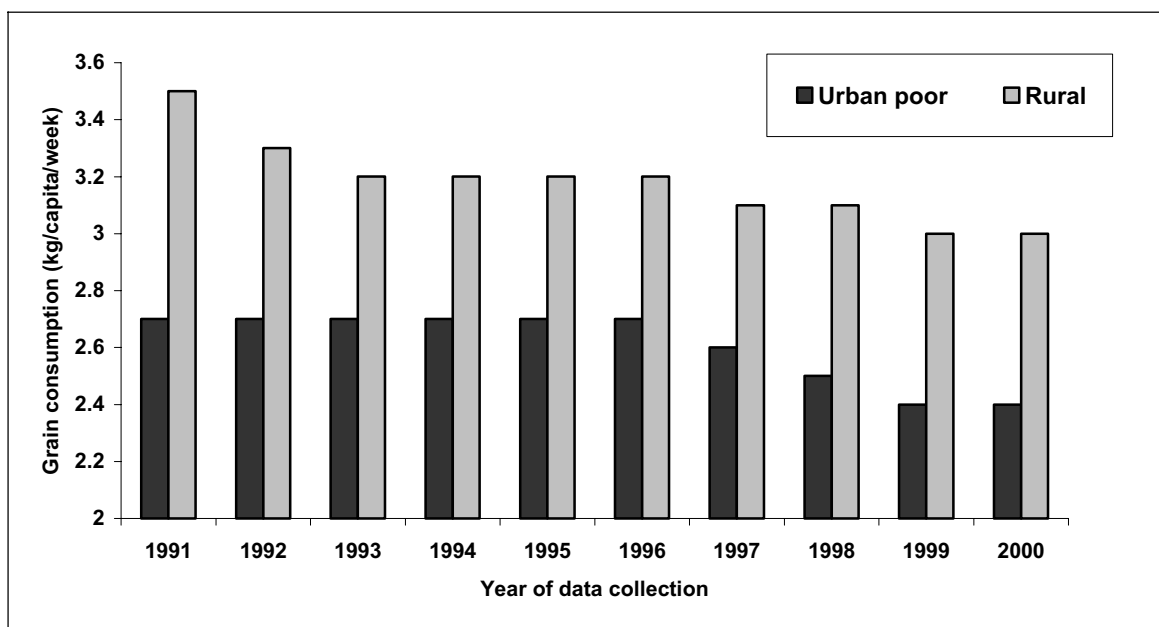


FIGURE 3
Prevalence of wasting (weight-for-height Z-score <-2 SD) among 6-59 months old children in urban poor areas of Dhaka, Khulna and Chittagong between 1990 and 2000 (n=108 215)

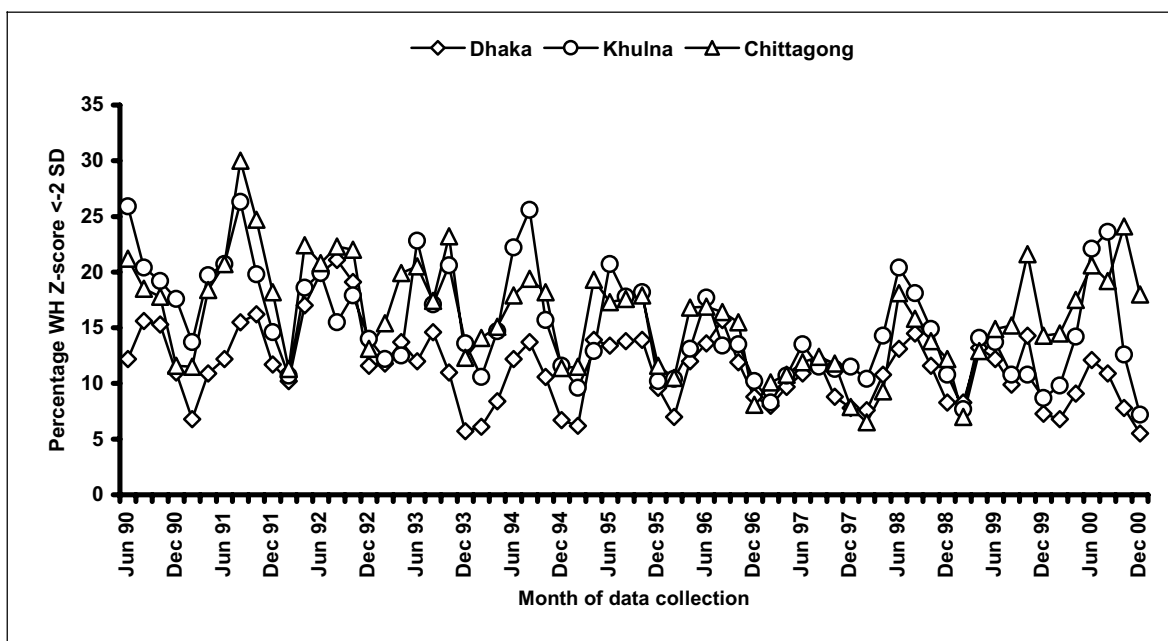
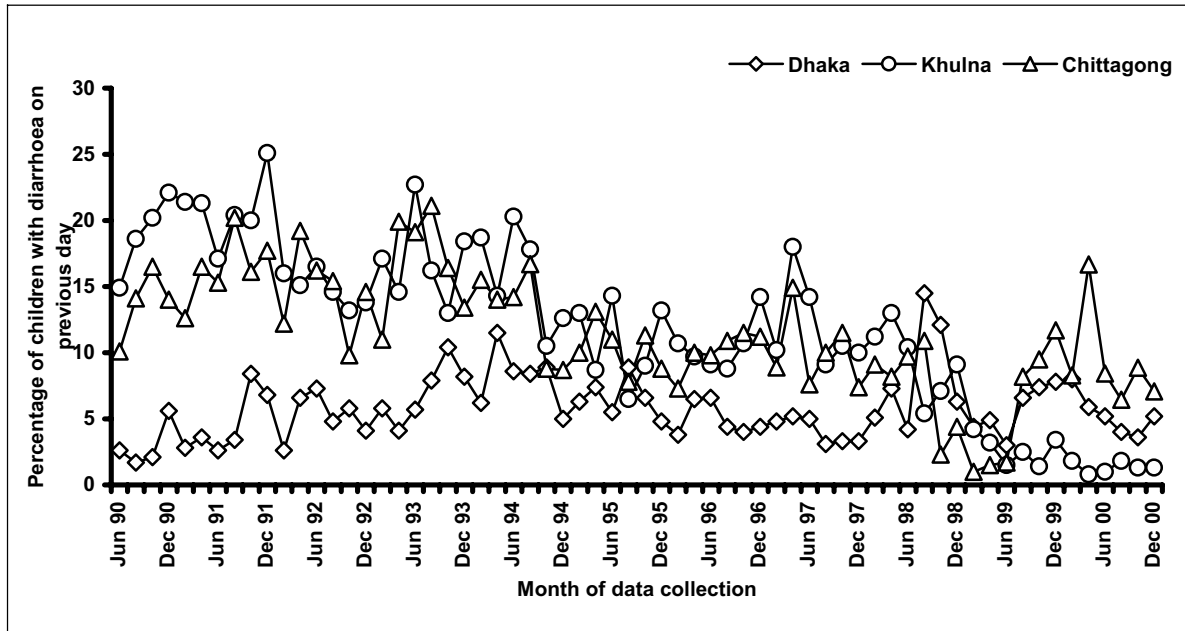


FIGURE 4
Prevalence of diarrhoea on the day before the interview among children aged 6-59 months old in urban poor areas of Dhaka, Khulna and Chittagong between 1990 and 2000 (n=108 441)



HOUSEHOLD SIZE

Figure 5 shows a gradual decline in the number of children under five years old in households during the period 1990-2000, in urban poor areas as well as in rural Bangladesh. This reflects child spacing that, in fact, results in smaller families, as can be concluded from Figure 6. Families in urban areas are smaller, which may be mainly related to having fewer extended families, since the number of children under five per household is similar in both urban and rural areas. In concurrence with the gradual decline of household size, the crowding at household level among the urban poor also shows a decline from 1991 to 2000. The density of people in a household, expressed as the number of household members per 100 ft² (929.03 cm²) (obtained by dividing number of household members by area of the house), has declined in all slum areas from which households were sampled. In Dhaka, household density has fluctuated between 5.3 (1999) and 7.3 (1994), in Khulna it decreased from 5.9 to 5.1 and in Chittagong from 8.2 to 7.0. Further analysis should provide more in-depth understanding of how this relates to the increase of the urban population.

FIGURE 5
Number of children under five years old per household in urban poor areas of Dhaka, Khulna and Chittagong and in rural Bangladesh between 1990 and 2000 (urban n=86 183, rural n=446 559)

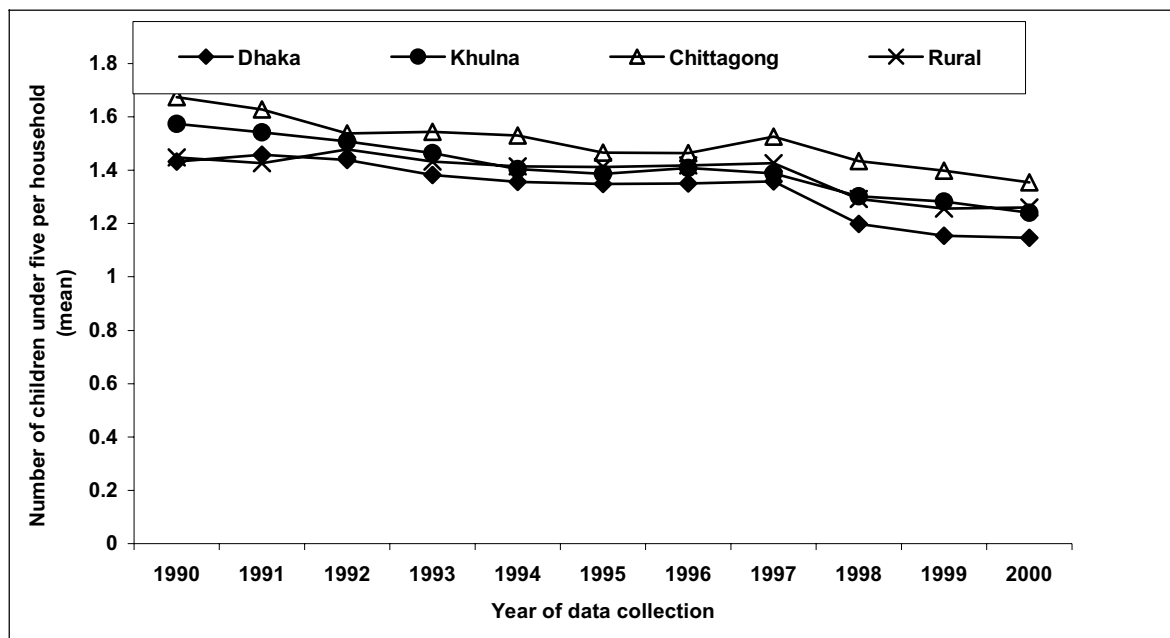
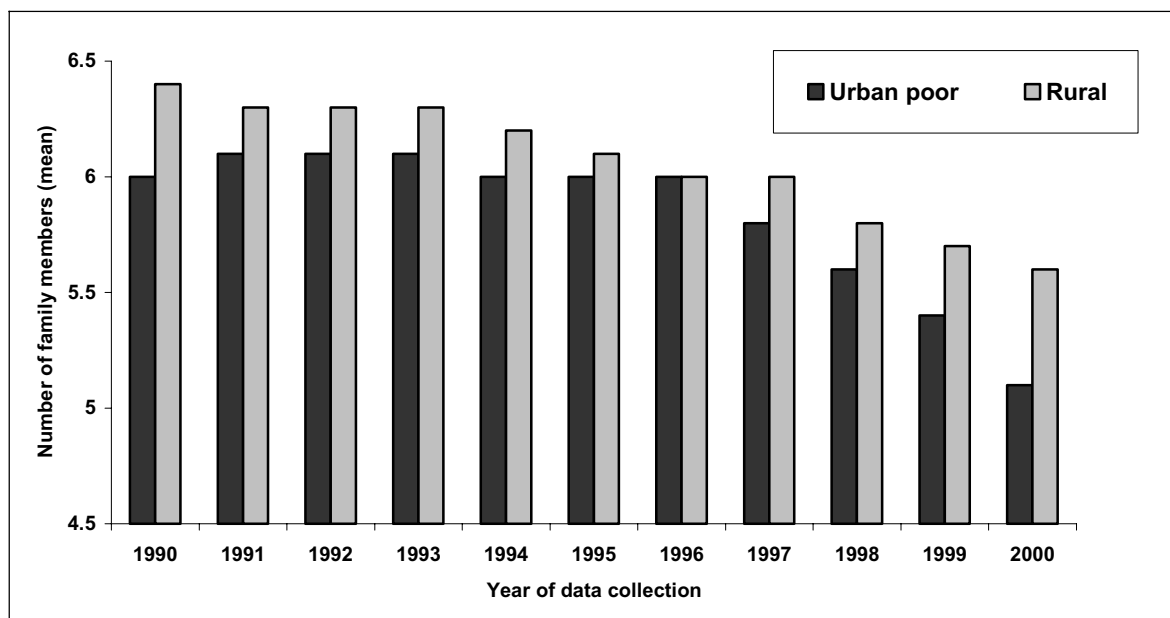


FIGURE 6
Number of household members (people eating from the same pot) in urban poor and rural areas of Bangladesh between 1990 and 2000 (urban n=86 182, rural n=446 544)



EDUCATION

Figure 7 shows that the percentage of women with no formal education declined between 1990 and 2000, particularly in rural areas. Because most women had their education during their childhood and early adolescence, the figure reflects the trend in education during the

1980s and early 1990s. The fact that the percentage of women without formal education was higher in the urban areas may reflect both poorer schooling facilities for the urban poor as well as migration of poorer women (and men) to urban slums. It should also be noted that by 2000, 56-69 percent of mothers of children under five had not received any formal education.

Figure 8 shows the height-for-age Z-score of 6-59 months old children by the number of years of formal education that their mother had undergone. Z-scores were lowest, and therefore prevalence of stunting highest, among children of mothers who had not had any formal education and Z-scores were better with every extra year of education the mother had obtained.

FIGURE 7

Percentage of mothers without formal education among urban poor and rural population of Bangladesh between 1990 and 2000 (urban n=85 481, rural n=455 322)

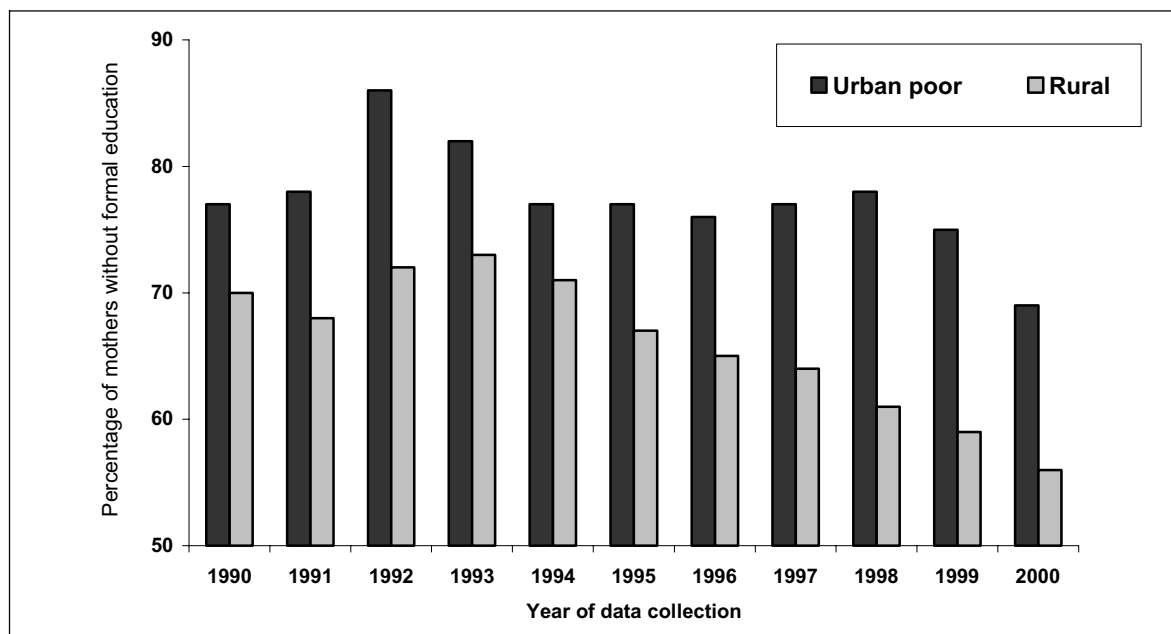
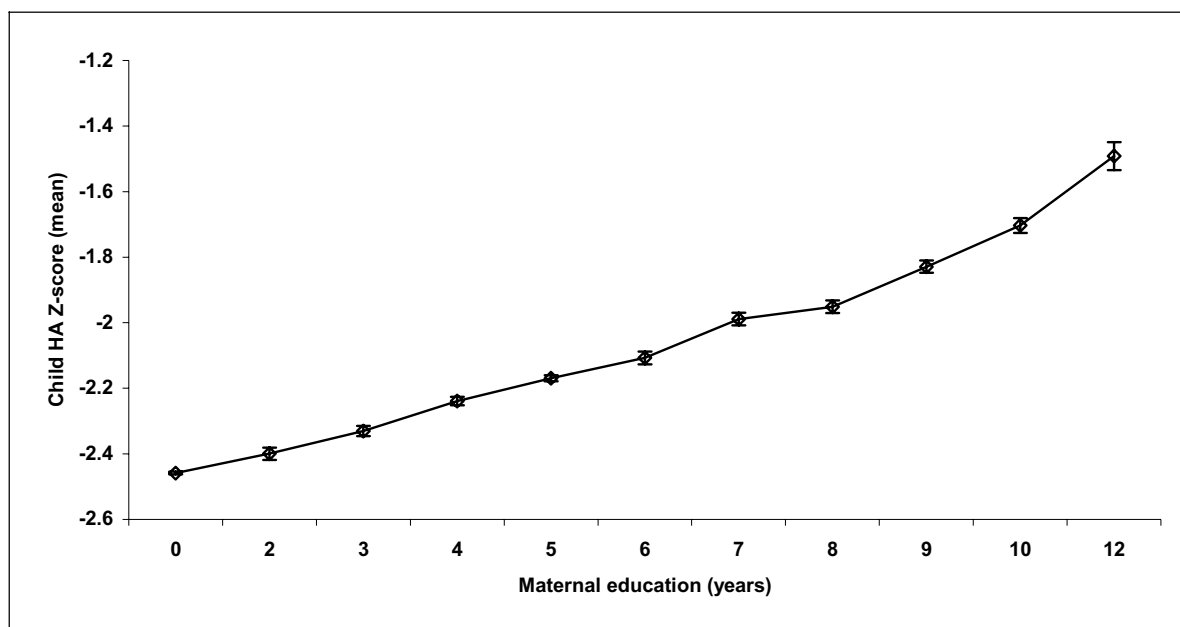


FIGURE 8
Average height-for-age Z-score for children aged 6-59 months by mother's number of years of formal education, rural Bangladesh, 1990-2000 (n=547 327). Bars indicate 95 percent confidence intervals



MATERNAL HEALTH

Figure 9 shows that among mothers the prevalence of night blindness, the first clinical sign of vitamin A deficiency, has always been lower in urban than in rural areas and that it might be declining in rural areas.³

Figure 10 shows a slight decline in the percentage of mothers who are chronically energy deficient (BMI < 18.5 kg/m²) from the beginning of 2000 to the end of 2002.⁴ The largest improvement was found in the urban poor areas of Chittagong where the prevalence decreased from 48 to 37 percent. In Khulna's urban poor areas it declined from 43 to 35 percent and in Dhaka from 24 to 21 percent. There is considerable seasonal variation in the urban poor areas of Chittagong and some in the urban poor sites of Dhaka, whereas in the urban poor areas of Khulna the declining curve hardly showed any seasonal patterns.

³ Prior to 1992, the NSP did not collect data on night blindness among mothers.

⁴ Weight and height of mothers were not collected until 2000, so that data are shown for 2000-2002 instead of for an earlier period.

FIGURE 9
Prevalence of night blindness among mothers in urban poor and rural areas in Bangladesh between 1992 and 2000 (urban n=68 020, rural n=387 119)

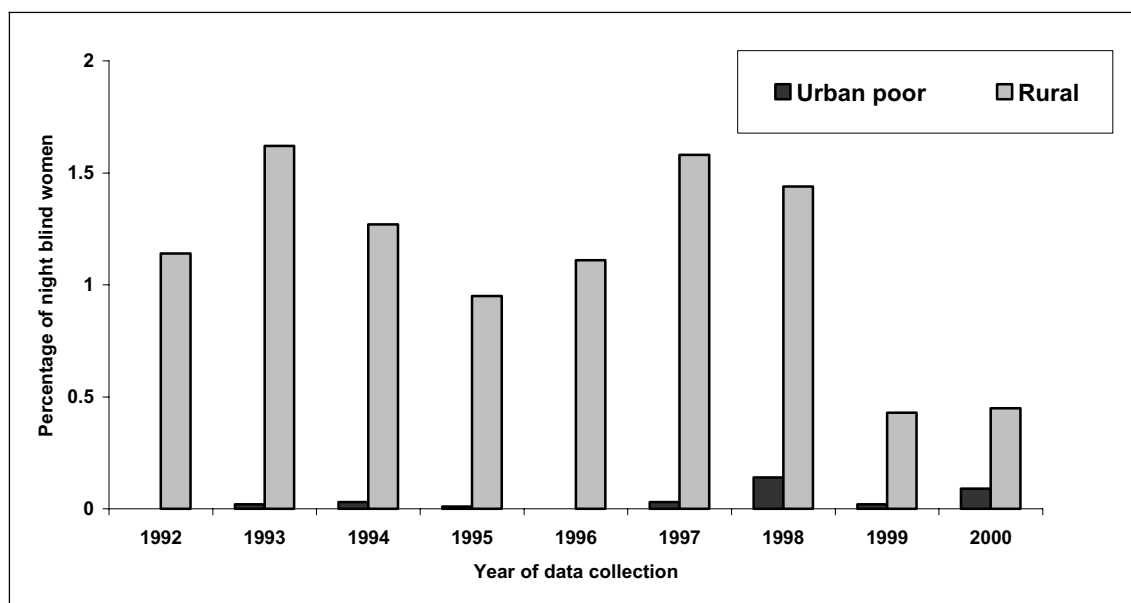
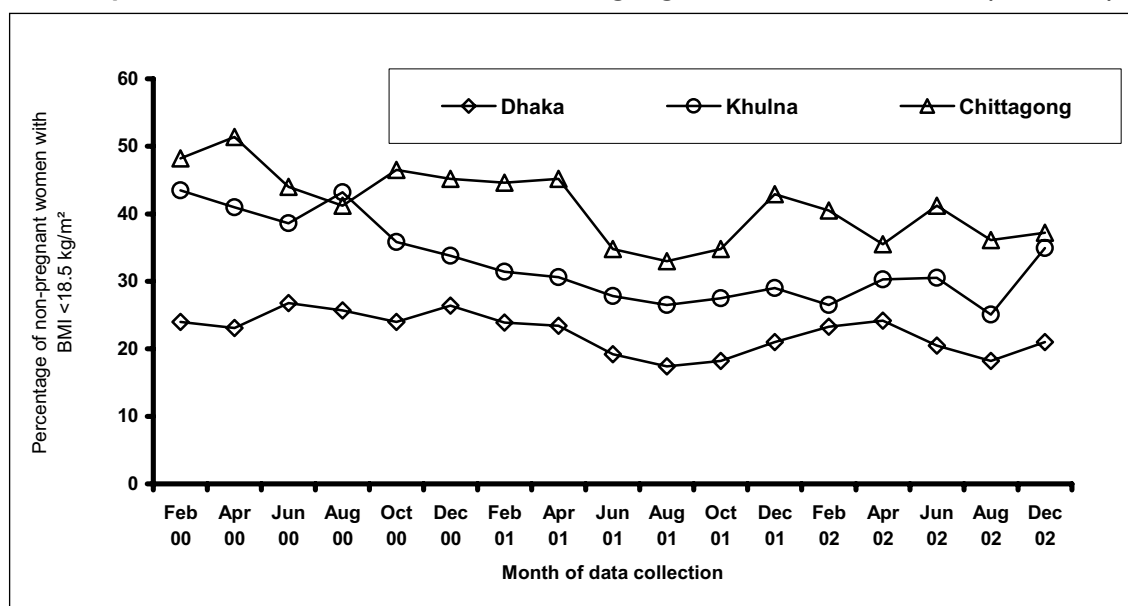


FIGURE 10
Percentage of non-pregnant mothers with chronic energy deficiency (BMI <18.5 kg/m²) in urban poor areas of Dhaka, Khulna and Chittagong between 2000 and 2002 (n=22 997)



DISCUSSION

Bangladesh is still predominantly a rural country and one of the poorest countries in the world, where an estimated 36 percent of the population live on less than US\$1 a day (UNDP, 2003). However, since the country's independence in 1971, there has been an increase in urbanization, and the predictions are that Dhaka will become one of the largest urban centres, with about 20 million inhabitants, by the year 2015 (Asian Development Bank, 2001). This will have dramatic consequences for the country and specifically for

reaching the various MDGs by the year 2020. The Government of Bangladesh has an enormous task to improve the infrastructure of Dhaka and its other major cities. The majority of the urban poor are migrants from the rural areas seeking employment. There is a lot of pressure on the land in rural Bangladesh. Only 15 percent of rural farmers are net producers of rice, the main crop in the country. Most of the virtually landless sell their daily labour to the relatively richer farmers (Bloem *et al.*, 1994).

Short introduced the concept of “black holes and loose connections” in the global urban hierarchy by using two data sets: the principal agglomerations of the world by Brinkhoff and the “Globalization and World Cities Group and Network” (GAWC) (Brinkhoff, 2001; GAWC, 2002; Short, 2002). These concepts allude to cities with large populations that are not considered to be connected to the flow of global capital – intellectual, material and financial – and therefore losing out on the benefits of globalization. Both Dhaka and Chittagong are cities with a population of over three million people, but they lack the connectivity which is so typical for world cities such as Tokyo, New York and Seoul. Short argues that these cities do not have the capacity to use the process of globalization in an optimal way, and defines Dhaka and Chittagong as large “non-world cities”.

Countries such as Bangladesh are, in a way, trapped in a vicious cycle of poverty, under-education and undernutrition. The only way for development to be sustainable in such a context is to stimulate the growth of a sizeable middle class to spur economic growth and participation in globalization. To breed such a consumer middle class is by producing a workforce with adequate health and education to attract the relocation of industrial bases (e.g. manufacturing) to these countries, and to ensure that wage levels are adequate to generate disposable income. Therefore it is necessary to achieve the second MDG of achieving universal primary education to bring the educational level of the population and its potential workforce to the basic minimum. The NSP data showed that some progress has been made in the country’s rural areas, which reflects the national data presented in the latest human development report, but there has hardly been any progress among women in the urban slums over the past ten years. This could be because women in the urban slums are largely the illiterate women who migrated from rural Bangladesh. More data collection is necessary to explore the enrolment rates among children (boys and girls) aged six to 15 years coming from slum areas monitored by the NSP.

It is also necessary for progress in the first MDG – to eradicate extreme poverty and hunger – to be achieved to reduce the number of people living below the poverty threshold and stimulate the growth of the middle class. Stunting or a low height-for age is an indicator that expresses a lack of linear growth. Several publications have shown that stunting is a very good proxy for poverty since the main cause of the growth problem is a lack of both energy and quality of diet. However, a paper by Frongillo, de Onis and Hanson (1997) argued that because the prevalence of stunting and wasting varied most among nations and among provinces within nations, that not only interventions at household level, but also at subnational and national level are clearly important (Frongillo, de Onis and Hanson, 1997). Their paper, using the same data set, showed that trends in malnutrition (measured by underweight) were highly associated with the food expenditure of non-grain products (Torlesse, Bloem and Kiess, 2003). Similar results were observed in Indonesia using data from a health and nutritional surveillance system to monitor the effects of the Asian economic crisis in Indonesia (Bloem and Darnton-Hill, 2000).

Proper health and nutrition are cornerstones of a competitive workforce, particularly in the context of a global economy. The interrelationships between adequate nutrition and good physical and cognitive development necessitate interventions and policy measures to ensure that the nutritional needs of the population, especially in young children, are

sufficiently met. In particular, there is growing recognition that a deficiency of iron, which leads to anaemia among children between the ages of six months and two years, can have a permanent impact on cognitive development, limiting the intellectual capacity of affected children. Productivity studies have also shown that iron-deficiency anaemia within an adult workforce can reduce physical capacity, and therefore productivity.

Environmental sustainability is also crucial to the well-being of the population in working its way out of poverty. Smith and Jalal documented a strong association between income levels and environmental problems related to pollution, water and sanitation, solid waste and the risk of disasters, such as floods (Smith and Jalal, 2000). Sewer systems are inadequate to support the high-density urban slums in Dhaka, Chittagong and Khulna. The ubiquity of two-stroke engine vehicles that emit more pollutants than other types of vehicles in cities such as Dhaka have resulted in poor air quality, with high levels of lead. In fact, these vehicles were banned in Dhaka from early 2003. Because anaemia leads to an increased risk of lead toxicity, since iron and lead are competing for the same receptors, environmental pollution in the form of high lead concentrations in the air will lead to even more negative health outcomes, particularly among children.

The development of cities has always been linked with processes at the global level and these processes have influenced the development of urban centres (Smith and Timberlake, 2002). Urbanization that is not managed properly can result in the failure of services, such as education and public health, in reaching the urban underclass that live in the slum areas of these large cities. Most of the cities in the region have many environmental problems: depletion and contamination of water resources, land contamination, air pollution and the loss of valuable natural resources. The economic impacts of pollution in urban areas in terms of loss of productivity and health costs have been estimated to exceed 10 percent of the GDP in some countries. This situation already exists in today's Bangladeshi cities, such as Dhaka, and other similar cities with large populations mired in poverty and a dysfunctional infrastructure. By 2015, with the population explosion in megacities such as Dhaka as projected, these problems will have been exacerbated to a point at which any intervention to address them will be exceedingly expensive. The window of opportunity to address these problems before they reach unmanageable scales becomes smaller every day and we cannot make real progress in meeting the MDGs.

The data of the NSP have been widely used to initiate, improve, or monitor programmes; shape policies; improve targeting for food aid and relief activities; and provide donors and interested agencies with specific information gained. Some specific findings and results of advocacy include the following.

- Some NGOs have been using the NSP data, rather than having to collect their own. For example, Concern has used the urban NSP data as a baseline for their own Urban Nutrition and Household Food Security Programme that is being conducted in Dhaka, Khulna and Chittagong.
- The NSP, as an independent data source, currently monitors the Bangladesh Integrated Nutrition Programme as well as progress towards reaching the MDGs.
- Data of the NSP are also being incorporated into the WHO global database on child growth and malnutrition.
- Information on the coverage of vitamin A capsule distribution among children of 12-59 months old in 1997-98 revealed pockets of consistent low coverage. A special module added to the routine NSP explored possible reasons and strategies in depth, revealing that passing through villages with a microphone to announce the capsule distribution and soliciting the help of imams at mosques were useful to raise awareness about the distribution date among people. Results were shared at national and subnational

planning meetings and in 1999 the capsule coverage had improved in all low-coverage areas (Chittagong, Barisal and Sylhet). Similarly, the data that revealed a very low coverage of postpartum distribution of vitamin A capsules among mothers have initiated the process that led to a policy change, increasing the period during which the capsule should be distributed.

In the same way, the NSP will continue to collect and share information about the specific situation and problems facing the urban poor in Bangladesh and contribute to understanding and limiting the scope of the problems.

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Urbanization, income and the nutrition transition in China: a case study

Michelle A. Mendez, Shufa Du and Barry M. Popkin¹

INTRODUCTION AND BACKGROUND

China has experienced extremely rapid urbanization in the past 20 years. Like many Asian countries, the proportion of the population in urban areas was relatively low in the 1980s. The urban population is projected to increase from 23 percent in 1985 to an estimated 41 percent by 2005 (see Table 1). There has been growth in urban agglomerations of all sizes. Between 1985 and 1997, the number of cities with over one million residents increased from 22 to 37, with similarly large increases in cities of 500 000 to one million (30 to 49), 200 000-500 000 (94 to 216) and <200 000 residents (178 to 365). The dynamic pace of urbanization is linked to rapid globalization and economic growth. China's average annual gross domestic product (GDP) growth of 11.2 percent between 1990 and 1998 was nearly triple the rate of 3.7 percent in other developing countries, excluding India (World Bank, 2001). This economic growth has been fuelled at least in part by expanding global linkages. Trade has doubled as a proportion of the goods GDP (18.4 percent in 1985, 27.8 percent in 1990 and 42.2 percent in 2000), and there has been a dramatic increase in foreign direct investment (0.9 percent of gross capital formation in 1985, 2.5 percent in 1990 and 11.5 percent in 2000 (World Bank, 2001).

These rapid socio-economic changes have had important effects on China's population. Economic growth has contributed to striking decreases in poverty: the rural population earning <US\$1/day fell from 42.5 percent to 24.0 percent between 1991 and 1997, while urban poverty fell from 1.0 to 0.5 percent (Chen and Wang, 2001). Globalization has led to greater availability of non-traditional foods, as more open markets have facilitated rising food imports. For example, imports accounted for 24.5 percent of vegetable oil in 2000, against 9.5 percent in 1980, during which time the per capita supply doubled (from 76.7 to 182.6 kcals/capita) (Food and Agriculture Organization of the United Nations [FAO], 2003). The changing investment climate has also facilitated the evolution of western-style supermarkets and fast food chains with foreign ownership (Reardon, Timmer and Berdeque, 2003; Bolling and Somwaru, 2001; Marr and Hatfield, 1997). In 2001, for example, supermarkets accounted for 48 percent of urban food markets in China, an increase beyond the 30 percent level in 1999 (Reardon, Timmer and Berdeque, 2003). Supermarkets have also begun to spread from big cities into smaller towns, including poorer areas in the interior (Reardon, Timmer and Berdeque, 2003). Meanwhile, direct

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imports of French fries from the United States increased tenfold between 1995 and 1999, and the number of Kentucky Fried Chicken outlets – the largest western fast food chain – increased to 600, up from about 250 in 1999 (Cee and Theiler, 1999; Rosenthal, 2002). In summary, China has experienced impressive socio-economic and cultural changes in a short time frame. The implications of these changes for population health and nutrition are, at present, not fully understood.

TABLE 1
Urbanization trends in China

	1985	1990	1995	2000	2005 (est)
CHINA					
Overall urban percentage	23.0	27.4	31.4	35.8	40.6
Average five-year Δ , urban percentage	3.15	3.51	2.70	2.64	2.50
Urban population (N)	246 089	316 563	382 334	456 340	535 958
Average five-year Δ , urban population	4.53	5.04	3.78	3.54	3.22
Rural population	824 086	838 737	837 015	818 793	785 406
Average five-year Δ , rural population	0.53	0.35	-0.04	-0.44	-0.83
WORLD					
World urban percentage	41.5	43.5	45.3	47.2	49.3
Least developed country urban percentage	32.1	35.0	37.7	40.4	43.1

Source: United Nations Population Division, 2002.

Urbanization and development are thought to play a role in the growing global epidemic of obesity, as these processes are often accompanied by lifestyle shifts such as sedentarism and increased consumption of fats and refined carbohydrates (Drewnoski and Popkin, 1997; Gittelsohn *et al.*, 2003). These shifts in diet and activity are characterized as part of the nutrition transition (Popkin, 2003). Indeed, China and other developing countries undergoing rapid growth have experienced considerable increases in the prevalence of overweight and obesity in the past ten years, coexisting with persistent undernutrition (Wang, Monteiro and Popkin, 2002; Du *et al.*, 2002; Doak *et al.*, 2000). Living in urban areas implies greater access to resources such as food markets, motorized transportation and health care services than living in rural areas – factors that may well contribute to obesity risk. While higher levels of obesity have been reported in urban areas than in rural areas of developing countries, little is known about how the process of urbanization may contribute to increasing obesity.

Traditional measures of urbanization include simple urban/rural dichotomies and changes in urban population size, which do not capture heterogeneity in infrastructure and resources within or across cities and urban towns. Consequently, the contribution of more urbanized ecology to obesity risk is unclear. Perhaps more important, such measures do not reflect urbanicity in areas designated as rural towns, many of which increasingly resemble urban areas. The growth of cities often stimulates development in rural areas to provide food and natural resource inputs for urban centres. Changes in resources and infrastructure may contribute to risk in urbanized rural areas, as well as in urban areas. Although China has the world's largest urban population, more than half the population lives in rural areas, and understanding health effects of "urbanization" in rural settings is crucial. Standard measures of urbanization also fail to capture the dynamic environmental changes taking place over time within cities, towns and villages, as infrastructure and resources are put in place. More nuanced, dynamic measures of urbanicity may contribute to better insights

into the impact of ecological changes on lifestyle shifts that may affect health or nutritional status.

In addition to increases in overall levels of obesity, a more recent phenomenon reported in some developing countries is rising obesity in low-income groups, suggesting obesogenic lifestyles are increasingly being adopted at all income levels (Monteiro, Wolney and Popkin, 2002; Monteiro *et al.*, 2000; Martorell *et al.*, 1998). Earlier studies found obesity and overweight predominantly in socio-economically advantaged groups. At present, little is known about whether and how urbanization may contribute to this phenomenon. Interestingly, such increases in low-income overweight have been reported only in more industrialized, or middle-income, countries (or regions within countries) (Martorell *et al.*, 1998; Monteiro, Wolney and Popkin, 2002; Monteiro *et al.*, 2003). This suggests that environmental factors play a role. Data are needed to assess the extent to which low-income overweight is limited to urban areas, and whether risk is increasing in "rural" areas with more urbanized environments. In addition, the types of diet and activity shifts that underlie this emerging overweight in low-income populations must be characterized to evaluate similarities and differences versus factors that contribute to obesity risk in high-income groups.

This case study on the nutrition transition in China has three objectives. First, we use an index of urbanicity, rather than simple urban/rural dichotomies, to describe trends in overweight/obesity across areas with different levels of infrastructure and resources. We also assess the extent to which overweight appears to be emerging within low- versus high-income groups in these areas. Next, in order to identify factors that may contribute to obesity risk, we assess the extent to which more diets in more urbanized areas differ from the traditional Chinese diet, which has low intakes of animal foods and edible oils and a large proportion of cereals (rice or wheat) eaten with vegetables. Dietary trends in different urban ecologies are examined by income level to understand better the extent to which urbanicity may promote potentially obesogenic dietary shifts in low-income groups. Finally, we describe changes in food prices in urban and rural areas to assess whether dietary shifts reflect changing prices.

METHODS

China Health and Nutrition Surveys (CHNS)

Data come from ongoing CHNS. These are household surveys in nine provinces that vary substantially in economic, health and demographic factors. Eight provinces (Guangxi, Guizhou, Henan, Hubei, Hunan, Jiangsu, Liaoning and Shandong) were included in 1991 and 1993; a ninth province (Heilongjiang) was added in 1997 when Liaoning did not participate. Households were selected using a multistage random cluster design. Samples in each province were drawn from the capital city and one lower-income city, as well as four rural counties selected at random (one low-, two middle- and one high-income). Neighbourhoods were selected at random from urban and suburban areas in each city, as well as the capital town, plus three villages from each county. Using official criteria of the Chinese Government, city and county capital towns were designated as urban and suburban areas and villages were designated as rural. A total of 190 communities was sampled and, within each community, all individuals in 20 households selected at random were interviewed. The analysis sample included all adults from 20 to 45 years old in 1991 (n=7 026), of which 95 percent participated in 1993 (n=6 662), and 75 percent (after excluding provinces not present in both rounds) in 1997 (4 470 of 6 220). Sixty-three percent of participants in 1991 were present in all three rounds. Data for 1993 (n=6 703) and 1997 (n=6 259) also included additional household members in the eligible age range

present in both follow-up rounds (n=41). The 1997 data also include households from Heilongjiang province, which was added in 1997 (n=709), and new households recruited to replace non-participants in 1997 (n=1 039).

Community surveys were administered to key informants to collect information on factors including infrastructure (such as water, transport systems and electricity); services (family planning, health facilities and retail outlets); economic factors (prevailing wage rates); food prices; and population size and area. These data were used to develop an index of urbanization (Mendez *et al.*, 2003). The urbanization index (range 0-100) sums scores for ten dimensions of urbanicity: population size, population density, access to markets, transportation, communications/media, economic factors, environment/sanitation, health, education and housing quality. Household data were used for the housing quality component. Variability in the index reflects heterogeneity within and between environments designated as urban as well as rural. As indicated by the range of scores, some rural towns have similar or higher levels of infrastructure and resources than some urban communities. Changes in index scores over time reflect developments taking place within communities: mean scores increase in both urban and rural communities, with faster rates of growth in rural areas. Community data on food prices were standardized to reflect prices for the same units at each point in time.

Trained interviewers collected anthropometric data (height and weight) on each individual in the household, used to calculate body mass index (BMI; weight in kg/height in m²). Data were available on 72-77 percent of individuals in each round of the analysis sample. World Health Organization criteria (BMI \geq 25.0) were used to classify adults as overweight/obese (hereafter "overweight"). For each round, there was no difference in overweight prevalence in the overall sample from that found among adults who had anthropometric data in all three rounds (60 percent).

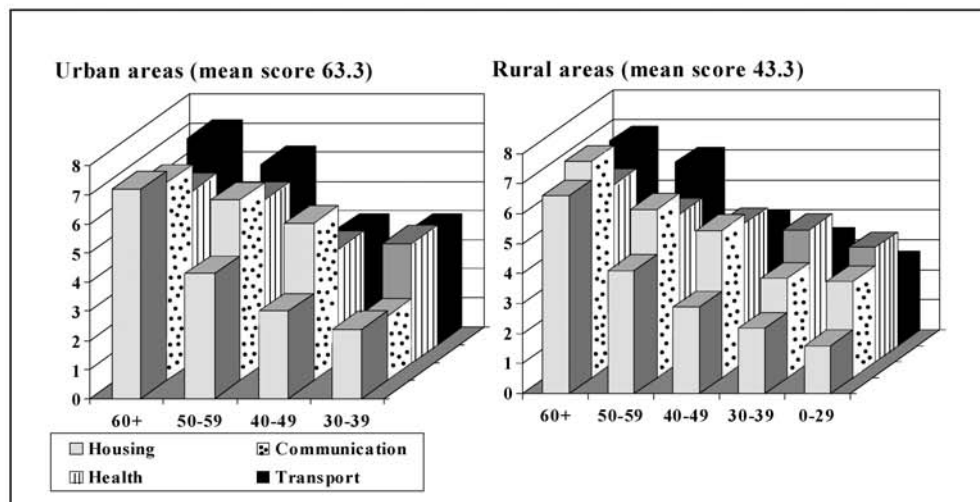
Three consecutive days selected at random of 24-hour dietary recalls were collected from each individual within each household (data available on 75-81 percent of individuals in each round). Food models and picture aids were used. Recalls were supplemented by a household food inventory, in which foods were weighed and measured before and after use. These data were used to provide validity checks on reported intakes, and to estimate more accurately added oils used in meat and vegetable dishes (Popkin, Lu and Zhai, 2003, in press). Chinese food composition tables were used to estimate intakes of energy and nutrients. High-fat diets were defined as diets with >30 percent of energy from fats. This analysis focuses on trends in intakes of energy, dietary fats and four key food groups: animal foods (which combine meat, poultry, fish and eggs), edible oils, vegetables and cereals (wheat, rice, other grains and grain products). Income was estimated from household data on earnings from market and non-market activities as well as subsidies (available on 99-100 percent of the sample). Per capita income was estimated using a household roster; income was deflated to 1988 yuan.

Methods

Because residents of urbanized areas have access to resources and infrastructure that may facilitate the diet and activity changes that promote energy imbalance, we hypothesized that in rural areas, greater urbanicity would be associated with higher levels of overweight, as well as

with rapid increases in overweight over time. Within urban areas, we also hypothesized that rapid increases in overweight may be taking place in less as well as more urbanized areas, where residents may be increasingly gaining access to resources and infrastructure once limited to the most urbanized areas. A further hypothesis was that in urbanized areas

FIGURE 1
The China urbanization index reveals variation within urban and rural communities



* Charts show mean scores for selected components at different levels of the urbanization index.

– whether designated as urban or rural – levels of overweight would be increasing rapidly in low-income populations, resulting in smaller disparities between low- and high-income groups. Hypotheses related to changing dietary patterns mirrored those for overweight. We expected that residents of more urbanized areas would consume large quantities of total dietary fat, animal foods and edible oils, and relatively low intakes of cereals and vegetables. We also expected that in urbanized settings, intakes of dietary fat, animal foods and edible oils would increase over time, displacing energy from cereals.

The urbanization index was used to classify areas as having high (top tertile) and low/moderate (bottom two tertiles) levels of urbanicity at each point in time. Similarly, individuals with per capita incomes within the top tertile were classified as having high incomes. Trends in overweight and dietary intakes in urban and rural communities at different levels of urbanicity were described using means and prevalences for each cross-section. Trends in low/moderate (hereafter “low”) as against high-income groups within these communities were also examined. The analysis was repeated, excluding the province added in 1997 to ensure the comparability of trends. We also repeated a number of analyses with the additional exclusion of new households added in 1997, with no meaningful change in results, although numbers in some cells were sparse (not shown). All analysis was conducted using STATA version 7.0 (Stata Corporation 2002, College Station, Texas, United States).

RESULTS

Sample characteristics

The analysis sample included more than 3 000 men and 3 000 women in each round (Table 2). Over time, CHNS sample communities became significantly more urbanized, and there were large, statistically significant increases in deflated per capita household incomes (ttest $p < 0.05$ for both income and urbanicity).

TABLE 2
Demographic, socio-economic and nutritional status characteristics of adults 20-45 years at baseline, China Health and Nutrition Survey (CHNS), 1991-1997¹

	Men			Women		
	Urban	Rural	All	Urban	Rural	All
Sample size N (%)						
1991	1 063 (31)	2 340 (69)	3 403	1 140 (31)	2 483 (69)	3 623
1993	972 (30)	2 277 (70)	3 249	1 042 (30)	2 412 (70)	3 454
1997	977 (31)	2 146 (69)	3 123	983 (31)	2 153 (69)	3 136
Mean (sd) age*						
1991	31.5 (7.2)	31.4 (7.7)	31.4 (7.5)	30.6 (7.2)	30.7 (7.6)	30.7 (7.5)
1993	33.6 (7.3)	33.4 (7.7)	33.4 (7.6)	32.7 (7.2)	32.8 (7.6)	32.7 (7.5)
1997	37.6 (7.2)	37.7 (7.8)	37.7 (7.6)	37.4 (7.2)	37.7 (7.7)	37.6 (7.6)
Mean (sd) urbanicity score*						
1991	63.3 (9.3)	43.1 (11.5)	49.4 (14.3)	63.3 (9.3)	43.5 (11.5)	49.7 (14.2)
1993	65.4 (9.7)	44.9 (11.9)	51.0 (14.7)	65.3 (10.2)	45.1 (11.8)	51.2 (14.7)
1997	69.3 (10.1)	49.7 (12.8)	55.8 (15.1)	69.3 (10.3)	49.9 (13.0)	56.0 (15.2)
Mean (sd) deflated HH income/capita^{2*}						
1991	1 439 (827)	1 034 (838)	1 161 (855)	1 426 (825)	1 061 (915)	1 176 (904)
1993	1 673 (1 327)	1 148 (1 168)	1 305 (1 241)	1 710 (1 447)	1 174 (1 197)	1 336 (1 301)
1997	2 527 (2 207)	1 840 (2 420)	2 054 (2 376)	2 521 (2 041)	1 874 (2 472)	2 076 (2 365)
Mean (sd) BMI*						
1991	21.8 (2.9)	21.3 (2.3)	21.5 (2.5)	21.9 (3.0)	21.7 (2.6)	21.8 (2.7)
1993	22.1 (2.7)	21.5 (2.3)	21.7 (2.4)	22.2 (3.1)	21.8 (2.7)	21.9 (2.8)
1997	23.1 (3.4)	22.1 (2.7)	22.4 (2.9)	23.1 (3.2)	22.4 (3.0)	22.6 (3.0)
Percentage overweight^{3*}						
1991	12.4	6.4	8.3	15.7	10.8	12.4
1993	15.9	7.1	9.6	17.9	12.3	13.9
1997	27.4	13.1	17.5	24.4	18.4	20.2
Percentage underweight^{4*}						
1991	8.9	7.0	7.6	9.6	8.4	8.8
1993	7.6	5.5	6.1	7.0	8.5	8.0
1997	3.9	4.5	4.4	4.4	5.8	5.4

¹ Baseline for this analysis = 1991. ² Income deflated to 1988 yuan. ³ Overweight/obese defined as BMI \geq 25.0.

⁴ Underweight defined as BMI $<$ 18.5.

* chi-square (categorical) or ttest (continuous) $p < 0.05$ for differences between consecutive rounds (1991-93 and 1993-97) in both men and women.

Although income and urbanicity were positively associated, correlations were moderate ($r=0.16$ in 1991, 0.33 in 1993 and 0.35 in 1997). Thus there was substantial heterogeneity in the distributions of high income and high urbanicity in the sample (Table 3a and 3b). For example, in both urban and rural areas, only about half of the residents in highly urbanized areas were high-income adults.

TABLE 3a
Distribution of the sample by urbanicity and income level¹

	Urban men			Rural men		
	Low/mod	High	All	Low/mod	High	All
Distribution by urbanicity level – N (percentage low versus high urbanicity)						
1991	197 (19)	866 (81)	1 063	2 083 (89)	260 (11)	2 343
1993	195 (20)	777 (80)	972	1 983 (87)	294 (13)	2 277
1997	289 (30)	688 (70)	977	1 804 (84)	342 (16)	2 146
1997, excluding Heilongjiang	209 (24)	659 (76)	868	1 561 (82)	342 (16)	1 903
1997, excluding Heilongjiang and new HH	92 (15)	512 (70)	604	1 368 (82)	297 (86)	1 665
Distribution by income and urbanicity level – N (percentage high income)						
1991						
Low income N	129	397	526	1 605	133	1 738
High income N	68	469	537	476	126	602
% high income	34.5	54.2	50.5	22.9	48.7	25.7
1993						
Low income N	127	364	491	1 560	127	1 687
High income N	68	413	481	423	167	590
% high income	34.9	53.2	49.5	21.3	56.8	25.9
1997						
Low income N	140	384	524	1 379	182	1 561
High income N	148	302	450	424	160	584
% high income	51.4	44.0	46.2	23.5	46.8	27.2

TABLE 3b
Distribution of the sample by urbanicity and income level¹

	Urban women			Rural women		
	Low/mod	High	All	Low/mod	High	All
Distribution by urbanicity level – N (percentage low versus high urbanicity)						
1991	222 (19)	918 (81)	1 140	2 191 (88)	293 (12)	2 484
1993	210 (20)	832 (80)	1 042	2 098 (87)	314 (13)	2 412
1997	292 (30)	691 (70)	983	1 792 (83)	361 (17)	2 153
1997, excluding Heilongjiang	213 (24)	658 (76)	871	1 547 (81)	361 (19)	1 908
1997, excluding Heilongjiang and new HH	93 (15)	508 (85)	601	1 327 (81)	314 (19)	1 641
Distribution by income and urbanicity level – N (percentage high income)						
1991						
Low income N	164	426	590	1 685	145	1 830
High income N	58	492	550	505	148	653
% high income	26.1	53.6	48.3	23.1	50.5	26.3
1993						
Low income N	137	389	526	1 630	135	1 765
High income N	73	443	516	468	179	647
% high income	34.8	53.3	49.5	22.3	57.0	26.8
1997						
Low income N	144	381	525	1 368	190	1 558
High income N	147	308	455	423	171	594
% high income	50.5	44.7	46.4	23.6	47.4	27.6

¹Urbanicity level defined as high if in the top tertile of urbanicity index; income defined as high if per capita income in the top tertile.

Nutritional status changes

Prevalence of overweight increased

The prevalence of overweight doubled in men (8.3-17.5 percent) and increased by 63 percent in women (12.4-20.2 percent) in the six years between 1991 and 1997 (Table 2). Overweight was twice as common in urban than in rural areas in men, and 30-50 percent higher in urban than in rural women.

Overweight levels increased more rapidly in urbanized rural areas and less urbanized urban areas

Stratifying by urbanicity level (Table 4a and 4b) showed that, consistent with our hypotheses, overweight prevalence was higher – and increased more rapidly – in highly urbanized rural areas than in less urbanized areas. In urban areas, overweight prevalence increased 1.5 to 2.0 times more quickly in low- than high-urbanicity areas. The most striking increases in overweight were observed in men in less urbanized urban areas. By 1997, 31 percent of men living in these areas were overweight, and the prevalence had overtaken the level in more urbanized areas (24 percent). Similarly, overweight in urban women increased more rapidly in low- than in high-urbanicity areas.

TABLE 4a
Shifts in the prevalence of overweight/obesity in Chinese men, CHNS 1991-97¹

	Urban men			Rural men		
	Low/mod	High	All	Low/mod	High	All
Overweight prevalence (%)						
1991	7.9	13.2	12.4	6.0	9.5	6.4
1993	23.3	14.1	15.9	6.3	12.0	7.1
1997	31.9	25.5	27.4	11.9	19.0	13.1
1997, excluding Heilongjiang	31.9	24.5	26.2	11.6	19.0	13.0
Prevalence Δ , 1991-1997	24.0	12.3	15.0	5.9	9.5	6.7
% Δ , 1991-1997	+303.8	+93.2	+121.0	+98.3	+100.0	+104.7
Overweight prevalence by income level (%)						
1991						
Low income	7.3	12.9	11.7	4.9	6.7	5.0
High income	8.9	13.5	13.0	9.9	12.0	10.4
High:low ratio	1.2	1.0	1.1	2.0	1.8	2.1
1993						
Low income	17.4	12.8	14.0	4.9	12.4	5.5
High income	34.9	15.2	17.8	11.3	11.8	11.4
High:low ratio	2.0	1.2	1.3	2.3	1.0	2.1
1997						
Low income	32.2	23.4	25.6	10.2	12.9	10.5
High income	31.7	27.8	29.1	17.5	25.6	19.8
High:low ratio	1.0	1.2	1.1	1.7	2.0	1.9

¹Overweight/obese defined as BMI \geq 25.0. ²For urban women in less urbanized areas, the 1997 prevalence of overweight in low- versus high-income groups is shown excluding Heilongjiang. Overweight prevalence was 23.3 versus 25.0 percent including Heilongjiang.

In urban areas, low-income overweight increased rapidly in both men and women

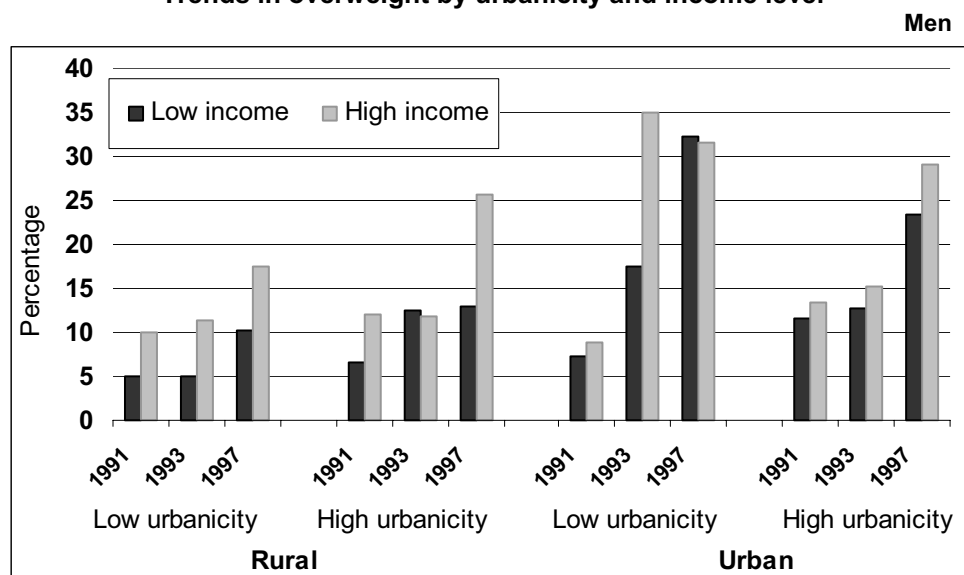
Further stratifying on income revealed that, in urban areas, disparities in overweight in high- versus low-income groups were generally small (Table 4a and 4b and Figure 2). Indeed, in the most urbanized areas, women with low incomes were as likely to be overweight as high-income women. Within low-, medium- and high-income tertiles, overweight prevalence among women in these highly urbanized communities was 15.9, 18.9 and 13.6 percent respectively in 1991, and 22.3, 25.7 and 23.0 percent respectively in 1997. Over time, both low- and high-income overweight increased considerably in urban areas, particularly in less urbanized settings. Among men, a large increase in high-income overweight between 1991 and 1993 was followed by a large increase in low-income overweight between 1993 and 1997. As a result, by 1997, overall increases among low-income urban dwellers were similar to those in high-income groups, and income disparities in prevalence were similar in 1991 and 1997.

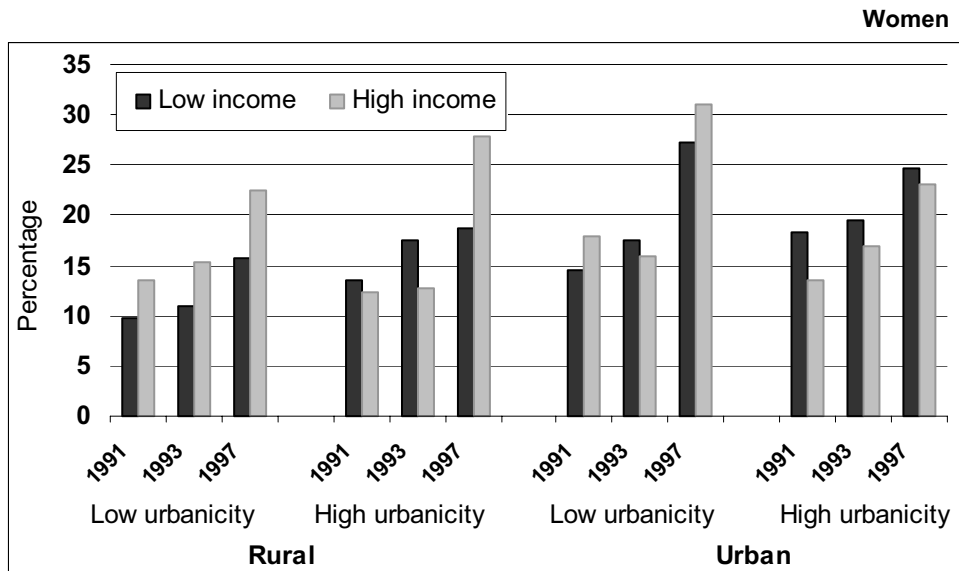
TABLE 4b
Shifts in the prevalence of overweight/obesity in Chinese women, CHNS 1991-97¹

	Urban women			Rural women		
	Low/mod	High	All	Low/mod	High	All
Overweight prevalence (%)						
1991	15.4	15.7	15.7	10.6	12.9	10.8
1993	17.0	18.2	17.9	11.9	14.7	12.3
1997	24.3	24.6	24.5	17.4	23.1	18.4
1997, excluding Heilongjiang	29.4	23.9	25.1	15.8	23.1	17.2
Prevalence Δ , 1991-1997	14.0	8.9	8.8	6.8	10.2	7.6
% Δ , 1991-1997	+57.8	+56.7	+56.1	+64.2	+79.1	+70.4
Overweight prevalence by income level (%)						
1991						
Low income	14.5	18.3	17.3	9.7	13.5	10.0
High income	17.9	13.6	14.0	13.5	12.4	13.3
High:low ratio	1.2	0.7	0.8	1.4	0.9	1.3
1993						
Low income	17.5	19.4	18.9	10.9	17.5	11.5
High income	16.0	17.0	16.9	15.3	12.7	14.5
High:low ratio	0.9	0.9	0.9	1.4	0.7	1.3
1997 ²						
Low income	23.4	25.7	25.1	15.7	18.6	16.1
High income	27.8	23.4	23.9	22.5	27.9	24.1
High:low ratio	1.2	0.9	1.0	1.4	1.5	1.5

¹Overweight/obese defined as $\text{bmi} \geq 25.0$. ²for urban women in less urbanized areas, the 1997 prevalence of overweight in low- versus high-income groups is shown excluding heilongjiang. Overweight prevalence was 23.3 versus 25.0 percent including heilongjiang.

FIGURE 2
Trends in overweight by urbanicity and income level





Recent increases in rural overweight were concentrated in high-income groups

In urbanized rural areas, low- and high-income groups had similar levels of overweight in 1991 and 1993. With rapid increases in overweight among high-income residents of these communities between 1993 and 1997, however, there were large disparities in 1997. In rural areas at low levels of urbanicity, overweight was about twice as prevalent in high- as in low-income rural men, and about 40 percent higher in high-income women. As there were similar increases in overweight at all income levels, these disparities were maintained over time.

Underweight prevalence declined over time

The prevalence of underweight (BMI<18.5) declined substantially over time, from 7.6 percent in men and 8.8 percent in women in 1991, to 4.4 percent in men and 5.4 percent in women in 1997. Rates of decline were faster in urban than in rural areas (Table 2). However, the data did not suggest that level of urbanicity was strongly associated with patterns of underweight prevalence (associations not significant; not shown).

Shifts in food consumption patterns

Energy intakes decreased, but not in low-urbanicity urban areas

Mean intakes of energy were close to recommended levels, and declined slightly over time in most types of communities (Table 5a and 5b). Overall, mean intakes declined from 101.8 percent of the Chinese recommended daily allowance (RDA) in 1991 to 95.2 percent in 1997, with means below the RDA in rural (92.0 percent) but not urban (102.7 percent) residents. Intakes also declined slightly in absolute terms. Mean energy intakes in each round were 2 943 (749), 2 820 (754) and 2 809 (1 099) in men, and 2 541 (636), 2 437 (748) and 2 422 (1 005) in women. However, in low-urbanicity urban areas – where the most dramatic increases in overweight prevalence took place – energy intakes increased or remained stable over time (from 101 to 106 percent of the RDA in men and 102 to 103 percent in women). This increase appeared to be even larger after restricting the data to individuals whose reported energy intakes were well within plausible levels for their estimated basal metabolic rate, using habitual ranges of activity considered normal in industrialized countries (from 100 to 109 percent). In absolute terms, mean (sd) intakes in these communities for 1991, 1993 and 1997, respectively, were 2 736 (704), 2 748 (751) and 2 806 (793) kcals among men, and 2 412 (668), 2 445 (679) and 2 361 (598) among women.

TABLE 5a
Shifts in mean intakes of energy, fat and selected food groups in urban and rural areas by level of urbanicity¹

	Urban men			Rural men		
	Low/mod	High	All	Low/mod	High	All
Energy and dietary fat intakes						
Percentage of energy RDA						
1991	100.2	104.1	103.4	101.6	101.0	100.6
1993	96.6	100.9	100.0	95.9	96.2	96.0
1997	106.1	101.9	103.2	91.6	97.3	92.5
1997, excluding Heilongjiang	103.3	101.9	102.2	91.7	97.3	92.8
% Δ, 1991-97	+5.9	-2.1	-0.2	-9.8	-3.7	-8.1
Percentage of energy RDA, if intakes plausible						
1991, plausible	103.5	107.1	106.6	95.6	101.5	96.3
1993, plausible	96.9	105.5	103.9	92.5	100.1	93.6
1997, plausible	110.6	102.7	104.7	89.9	95.5	90.9
% Δ, 1991-97	+6.9	-4.1	-1.8	-6.0	-5.9	-5.6
Fat (as % kcals)						
1991	21.4	27.0	26.0	19.0	24.9	19.7
1993	25.7	29.6	28.7	19.9	28.6	21.0
1997	33.4	32.6	32.8	23.4	33.0	25.0
1997, excluding Heilongjiang	33.5	32.6	32.8	23.6	33.0	25.3
% Δ, 1991-97	+56.1	+20.7	+26.2	+23.2	+32.5	+26.9
% ate high fat ²						
1991	15.1	36.5	32.7	11.3	26.3	13.1
1993	32.5	45.3	42.6	14.4	42.9	18.2
1997	58.8	59.3	59.2	22.5	55.3	27.9
1997, excluding Heilongjiang	59.7	59.5	59.5	23.1	55.3	28.9
% Δ, 1991-97	+289.4	+62.5	+81.0	+99.1	+110.3	+113.0
Food group intakes						
Percentage ate animal foods						
1991	80.9	94.4	92.0	68.0	92.2	70.8
1993	88.5	96.7	95.0	68.2	95.8	71.9
1997	94.3	97.8	96.7	74.4	94.7	77.7
1997, excluding Heilongjiang	93.4	97.7	96.6	75.2	94.7	78.8
% Δ, 1991-97	+16.6	+3.6	+5.1	+9.4	+2.7	+9.7
Animal foods (g)						
1991	105.3	174.5	162.1	84.7	157.0	93.1
1993	144.4	192.7	182.4	90.8	191.2	104.3
1997	190.9	203.4	199.5	100.6	213.7	118.6
1997, excluding Heilongjiang	199.2	202.6	201.7	106.6	213.7	126.1
% Δ, 1991-97	+81.3	+16.6	+23.1	+18.8	+36.1	+27.4
Edible oils (g)						
1991	34.4	44.2	42.7	35.9	40.8	36.5
1993	38.6	43.9	42.9	34.0	43.1	35.3
1997	55.7	43.7	47.7	43.4	46.4	43.9
1997, excluding Heilongjiang	57.5	43.0	46.8	41.2	46.4	42.2
% Δ, 1991-97	+61.9	-1.1	+11.7	+20.9	+13.7	+20.3
Vegetables (g)						
1991	339.8	313.4	318.1	381.0	343.8	376.6
1993	323.7	313.8	315.9	422.0	338.7	410.8
1997	335.3	307.9	316.4	376.0	367.0	374.6
1997, excluding Heilongjiang	337.4	308.4	315.5	367.6	367.0	367.5
% Δ, 1991-97	-1.3	-1.8	-0.5	-1.3	6.7	-0.5
Percentage energy, cereals						
1991	72.1	61.3	63.2	72.5	65.2	71.7
1993	67.6	58.2	60.2	71.4	58.4	69.6
1997	54.5	55.1	54.9	67.1	54.4	65.0
1997, excluding Heilongjiang	54.6	55.1	55.0	66.7	54.4	64.5
% Δ, 1991-97	-24.4	-10.1	-13.1	-7.4	-16.6	-9.3

TABLE 5b
Shifts in mean intakes of energy, fat and selected food groups in urban and rural areas by level of urbanicity¹

	Urban women			Rural women		
	Low/mod	High	All	Low/mod	High	All
Energy and dietary fat intakes						
Percentage of energy RDA						
1991	102.4	103.1	102.9	101.9	101.6	101.8
1993	101.0	100.2	100.4	96.3	97.7	96.5
1997	103.1	102.0	102.3	90.1	98.9	91.6
1997, excluding Heilongjiang	100.7	102.0	101.7	90.7	98.9	92.3
% Δ, 1991-97	+0.7	-1.1	-0.6	-11.6	-2.7	-10.0
Percentage of energy RDA, if intakes plausible						
1991, plausible	98.2	104.5	103.5	94.8	97.8	95.2
1993, plausible	99.2	102.7	101.9	91.3	99.2	92.5
1997, plausible	107.6	99.9	101.8	86.4	95.7	88.0
% Δ, 1991-97	+9.6	-4.4	-1.6	-8.9	-2.1	-7.6
Fat (as % kcals)						
1991	21.8	27.3	26.3	19.2	25.5	20.0
1993	26.7	29.9	29.2	20.2	29.9	21.5
1997	33.0	33.9	33.7	24.0	34.0	25.8
1997, excluding Heilongjiang	33.4	33.9	33.8	24.1	34.0	26.0
% Δ, 1991-97	+51.4	+24.2	+28.1	+25.0	+33.3	+29.0
% ate high fat ²						
1991	18.6	36.6	33.3	11.7	30.0	13.9
1993	31.0	46.6	43.4	14.6	45.0	18.6
1997	62.2	62.5	62.4	24.2	59.8	30.5
1997, excluding Heilongjiang	65.4	62.5	63.2	24.8	59.8	31.6
% Δ, 1991-97	+234.4	+70.8	+87.4	+106.8	+99.3	+119.4
Food group intakes						
Percentage ate animal foods						
1991	79.6	95.2	92.4	66.4	86.4	68.8
1993	89.9	96.4	95.1	65.9	93.8	69.6
1997	92.2	97.4	95.7	72.5	95.0	76.4
1997, excluding Heilongjiang	89.9	97.2	95.4	73.0	95.0	77.3
% Δ, 1991-97	+15.8	+2.3	+3.6	+9.2	+10.0	+11.0
Animal foods (g)						
1991	90.2	153.0	141.6	69.2	136.9	77.3
1993	116.5	158.4	149.7	72.7	165.0	85.0
1997	158.4	178.6	172.3	78.9	187.7	97.5
1997, excluding Heilongjiang	161.5	175.9	172.3	83.1	187.7	103.6
% Δ, 1991-97	+75.6	+16.7	+21.7	+14.0	+37.1	+26.1
Edible oils (g)						
1991	36.0	39.3	38.7	33.0	37.5	33.7
1993	34.5	38.6	37.9	31.6	39.6	32.8
1997	47.5	41.2	43.3	39.4	42.2	39.9
1997, excluding Heilongjiang	47.7	40.4	42.4	37.5	42.2	38.5
% Δ, 1991-97	+31.9	+4.8	+11.9	+19.4	+12.5	+18.4
Vegetables (g)						
1991	308.5	288.0	291.7	350.2	317.4	346.5
1993	311.4	290.0	294.4	395.8	319.6	385.7
1997	316.2	296.6	302.7	356.8	334.1	352.9
1997, excluding Heilongjiang	321.6	295.4	301.9	353.2	334.1	349.5
% Δ, 1991-97	2.5	3.0	3.8	1.9	5.3	1.8
Percentage energy, cereals						
1991	71.3	61.3	63.1	73.0	64.7	72.0
1993	66.7	58.6	60.3	71.7	57.9	69.8
1997	55.2	53.3	53.8	67.3	53.2	64.8
1997, excluding Heilongjiang	54.6	53.3	53.6	67.1	53.2	64.4
% Δ, 1991-97	-22.6	-13.1	-14.7	-7.8	-17.8	-10.0

¹Low urbanicity = bottom two tertiles of index; high urbanicity = top tertile. ²High fat defined as >30 percent of energy.

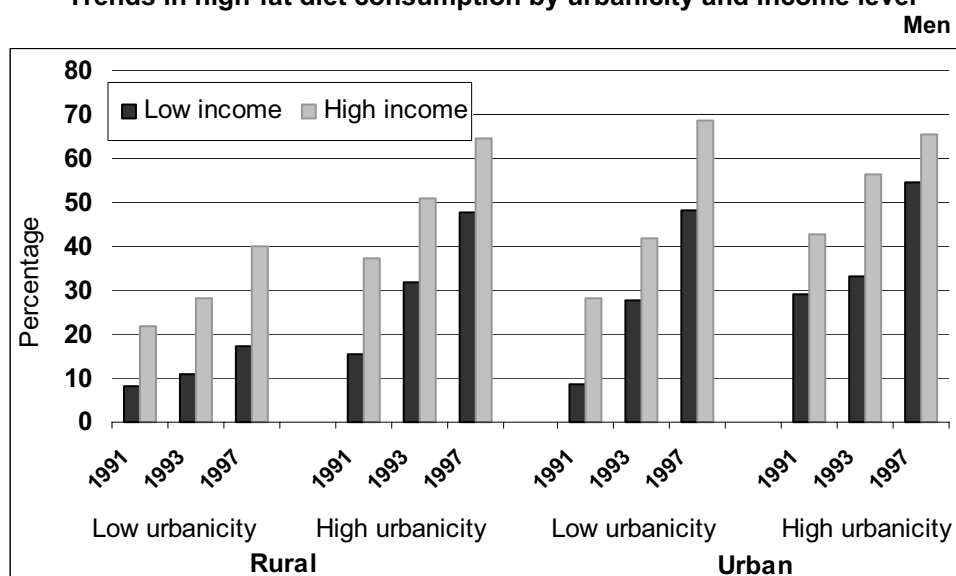
Total fat intakes increased dramatically in all environments, particularly in less urbanized urban areas

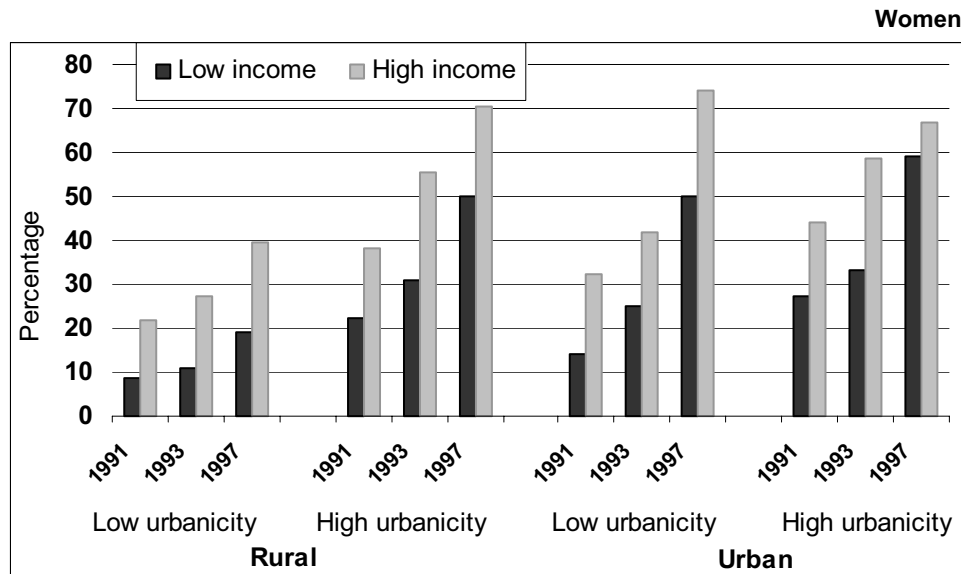
Overall, between 1991 and 1997, mean intakes of dietary fats increased from 21.8 to 27.7 percent of energy (see Table 5a and 5b). However, these means mask substantial heterogeneity across different types of communities. The largest increases were observed in less urbanized urban areas, where mean intakes increased by more than 50 percent, and in urbanized rural areas, where intakes increased by one-third. The proportion of adults consuming high-fat (>30 percent of energy) diets increased more than threefold in less urbanized urban areas, doubling in rural areas regardless of urbanicity level (Table 5a and 5b). Rates of increase were smaller in highly urbanized urban areas, where initial intakes were relatively high. As a result of these large increases, by 1997 more than 50 percent of residents in all urbanized areas consumed high-fat diets. As initial levels were very low, only half as many (about 25 percent) residents in low-urbanicity rural areas consumed similar diets.

Low-income adults increasingly consumed high-fat diets

High-fat diet consumption increased in both low- and high-income residents, although intakes remained higher in high-income groups (Figure 3). The proportion of high-income residents of urbanized rural areas consuming high-fat diets (70.6 percent of women and 64.4 percent of men) was similar to levels among high-income residents of urban areas (69.0 percent of women and 66.4 percent of men).

FIGURE 3
Trends in high-fat diet consumption by urbanicity and income level





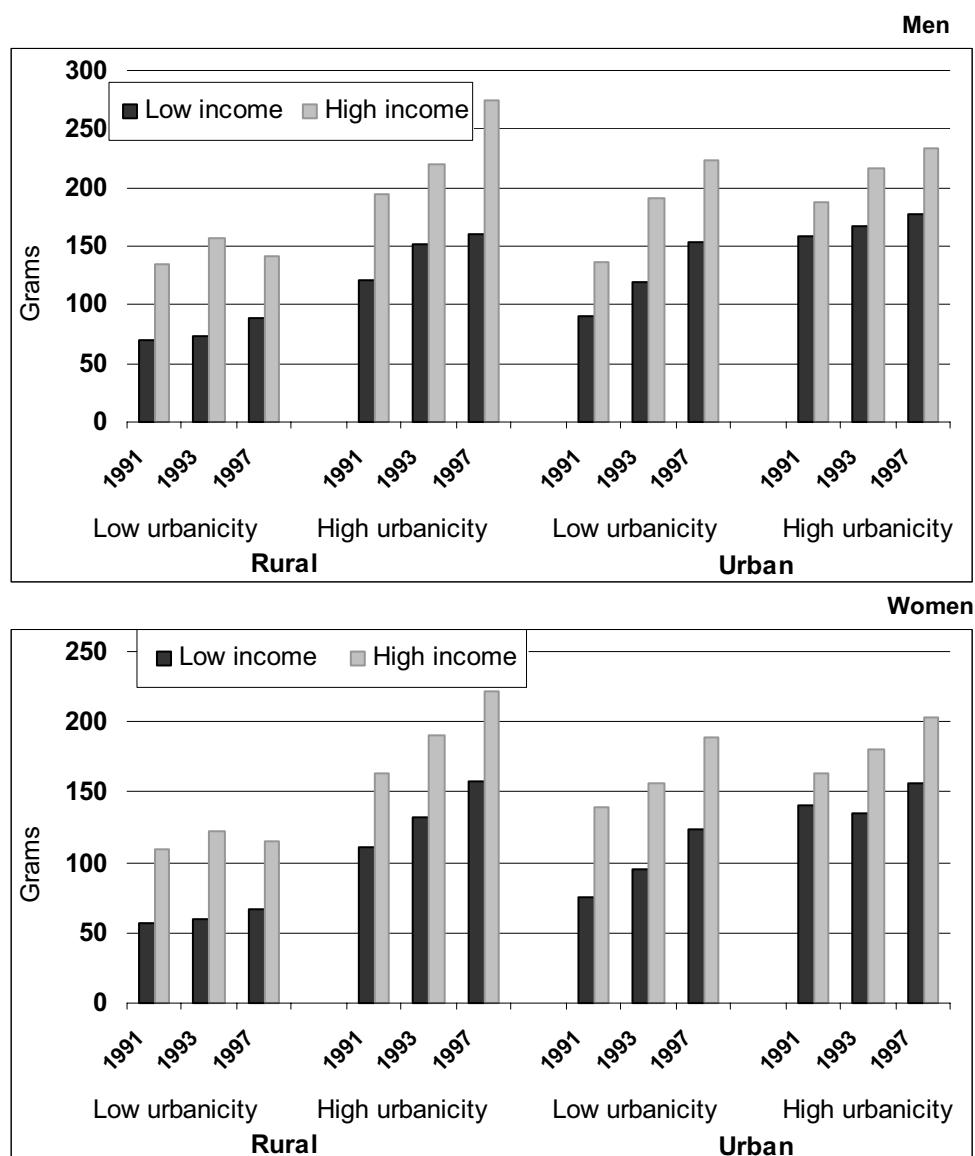
Animal food consumption remained low only in non-urbanized rural areas

From 1991 to 1997, mean intakes of animal foods (meats and poultry, fish and eggs) increased by about 25 percent, from 105.6 to 131.6 g/day. However, there was substantial variability in both amounts and rates of increase across different types of community settings (Table 5a and 5b). Both increases in consumption and ultimate levels of intake were substantial in less urbanized urban environments, as well as in urbanized rural areas. Increases over time were smaller in the most urbanized areas, where initial levels of intake were higher. By 1997, intakes in high-urbanicity rural areas (213.7 and 187.7 g/day in men and women, respectively) and low-urbanicity urban areas (199.2 and 161.5 g/day) had increased sufficiently to become comparable to those of high-urbanicity urban residents (202.6 and 175.9 g/day). In contrast, animal food intakes of adults living in less urbanized rural environments remained relatively flat over time. The mean amount of animal food consumed in these communities (103.3 and 83.1 g/day in men and women) was only half that in other areas.

Animal food intakes remained larger in high- than low-income groups

Disparities in mean intakes of animal foods in low- versus high-income groups were substantial (104.5 g/day versus 183.8 g/day in 1997) and, in most communities, persisted over time. In urbanized urban areas, disparities were relatively small in 1991 (26.9 g/day) but increased over time (50.8 g/day by 1997), as intakes increased largely in high-income subjects. Income disparities in the other communities were similar or somewhat larger in 1997: 66.5 g/day in less urbanized urban areas, 87.2 g/day in urbanized rural areas and 49.9 g/day in low-urbanicity rural areas.

FIGURE 4
Trends in animal food (g) consumption by urbanicity and income level



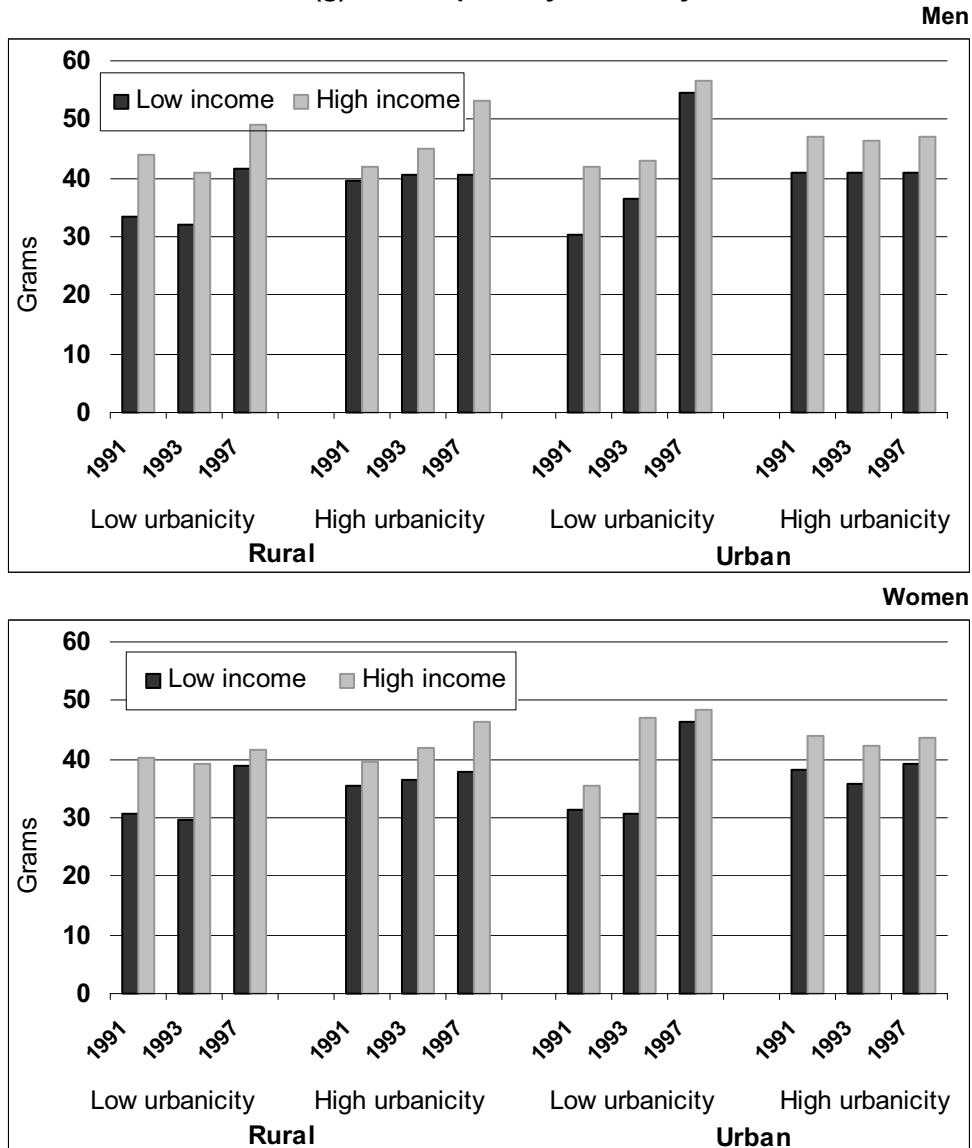
Edible oil consumption increased in rural areas and in less urbanized urban areas

Overall, consumption of plant oils also increased substantially over time, from 37.1 to 43.0g/day (Table 5a and 5b). As was observed with animal foods, intakes increased most dramatically between 1991 and 1997 in less urbanized urban areas (33.3 to 51.5 g/day), and there were large increases in urbanized rural areas (39.1 to 44.1 g/day). In contrast to animal foods, however, there were substantial increases in the most rural environments (34.4 to 41.3 g/day), and there were no increases in added oil consumption levels in the most urbanized areas (42.7 and 42.4 g/day).

In urban areas, low- and high-income groups had comparable trends in edible oil intakes

High-income adults generally consumed higher levels of added fats than low-income adults (Figure 5). However, in low-urbanicity urban areas both absolute intakes in 1997 and increases between 1991 and 1997 were similar, regardless of income. Intakes remained relatively flat over time in the most urbanized areas, regardless of income.

FIGURE 5
Trends in edible oil (g) consumption by urbanicity and income level



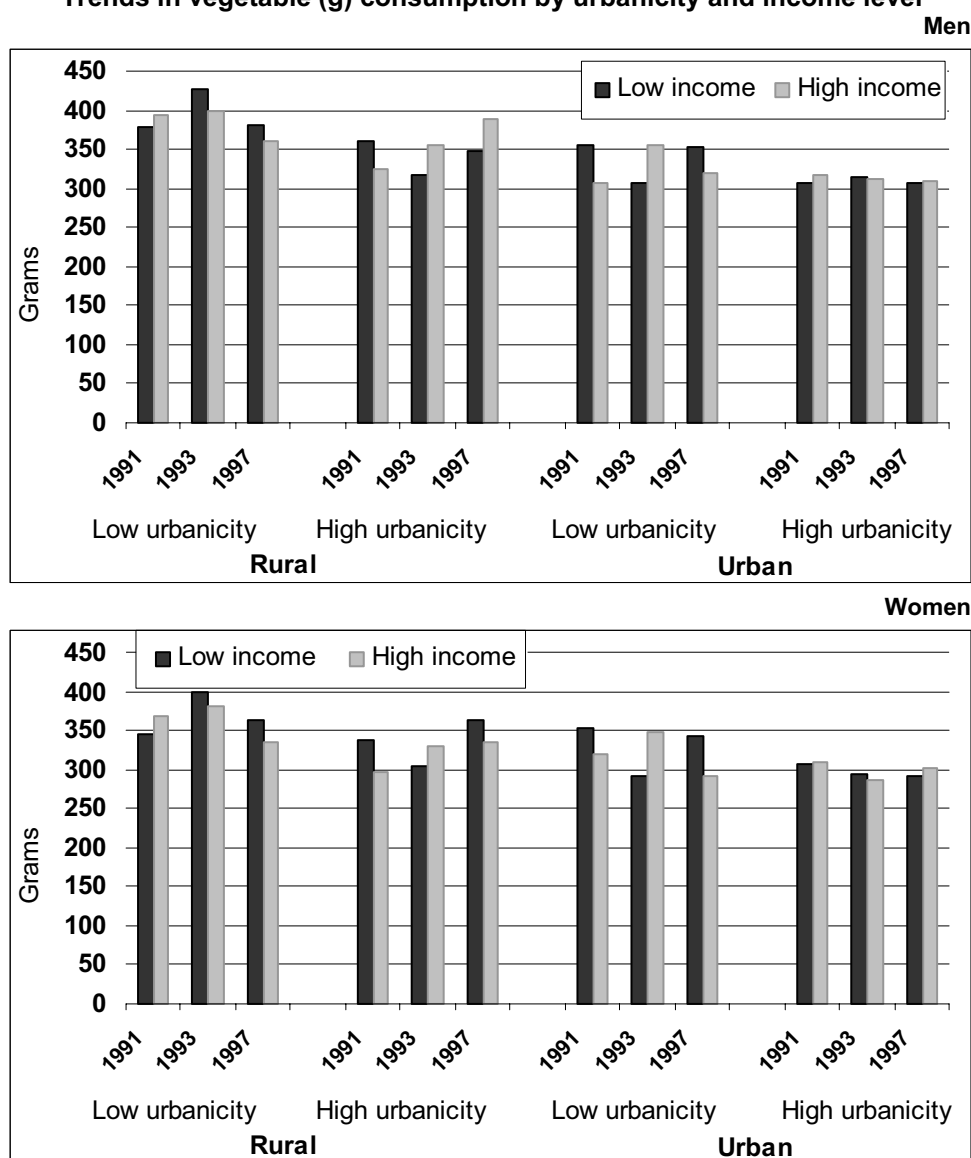
In rural areas, trends in oil intakes varied depending on urban context

In urbanized rural areas, both absolute levels and increases in edible oil intakes were concentrated in high-income adults (Figure 5). Income disparities in oil consumption increased over time in these communities. In low-urbanicity rural areas, however, high-income residents consumed much higher levels of added oils in 1991. However, as low-income groups increasingly consumed high quantities of edible oil, these income disparities fell over time.

Vegetable consumption was highest in the most rural settings

In contrast to animal foods and oils, mean intakes of vegetables were consistently higher in rural than in urban areas, as well as in low- rather than high-urbanicity areas (Table 5a and 5b). Vegetable consumption changed relatively little over time, although there were slight decreases in urban areas. Trends in rural areas were more irregular. Stratifying on income (Figure 6) showed that in the most urban areas, there was little difference in vegetable intakes by income group. However, there was substantial variation in the magnitude and direction of income disparities in other communities.

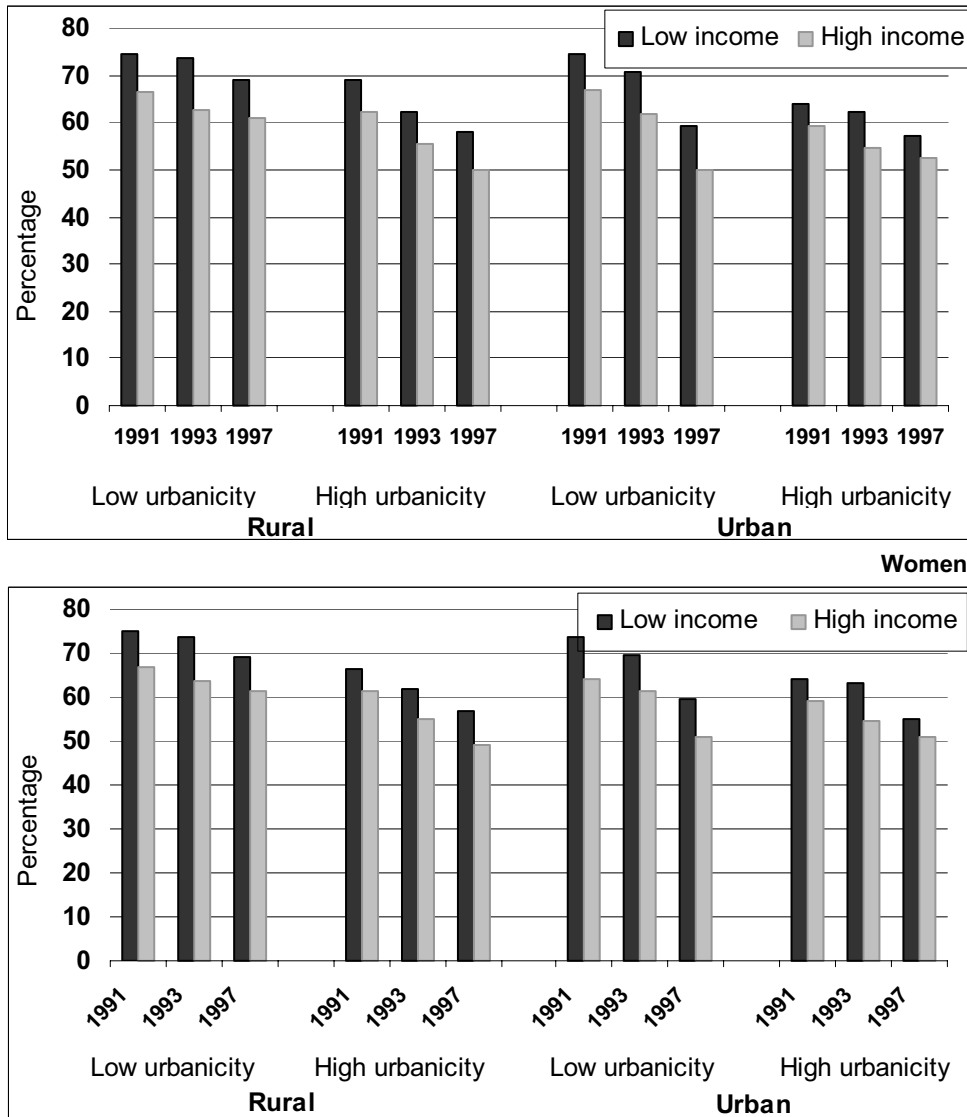
FIGURE 6
Trends in vegetable (g) consumption by urbanicity and income level



Cereal intakes fell in all communities

Intakes of cereals decreased substantially, from an average of 69.1 percent of energy in 1991 to 61.8 percent in 1997 (Table 5a and 5b and Figure 7). Reductions in the proportion of energy from cereals were smallest in residents of less urbanized rural areas (low-income 8 percent, high-income 9 percent). Intakes declined more substantially in all areas, but declines were particularly marked among residents of less urbanized urban areas.

FIGURE 7
Trends in cereal (% energy) consumption by urbanicity and income level



Food prices

Food prices fell more in urbanized than in truly rural areas

Relative prices for most food items were already lower in 1991 in urban than in rural areas (Table 6). Nonetheless, reductions over time in relative food prices were consistently substantially larger in urban than in rural areas. For example, reductions in the relative price of pork were nearly twice as large in urban (35.2 percent) as in rural areas (18.7 percent). Within both urban and rural areas, relative price reductions were also higher in more than in less urbanized communities (Figure 8).

TABLE 6
Shifts in food prices relative to prevailing wages, CHNS, 1991-1997¹

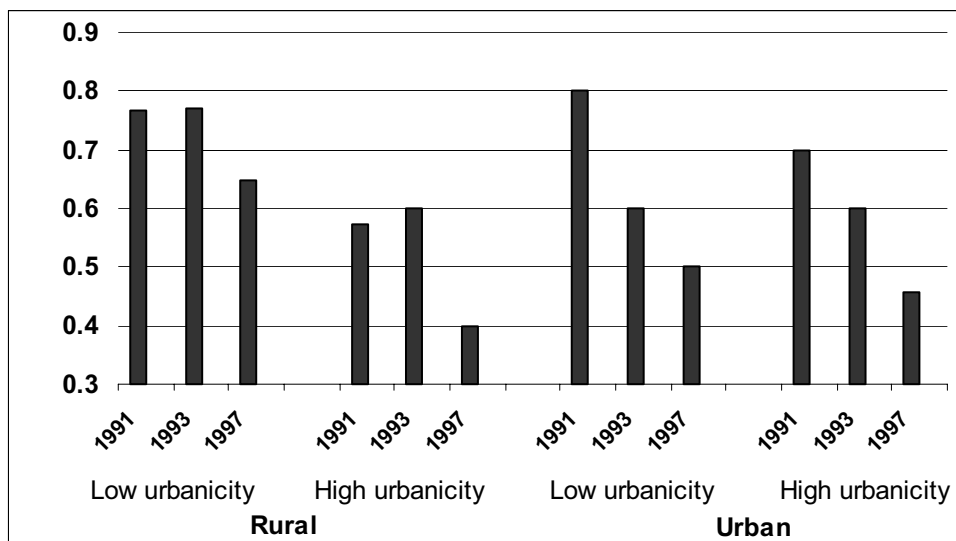
	Urban			Rural			Urban/rural ratio
	Low/mod	High	All	Low/mod	High	All	
Fatty pork							
1991	0.74	0.71	0.71	0.76	0.59	0.75	0.95
1993	0.65	0.58	0.59	0.78	0.62	0.76	0.78
1997	0.48	0.46	0.46	0.65	0.42	0.61	0.75
% Δ, 1991-97	-35.1	-35.2	-35.2	-14.5	-28.8	-18.7	1.88
Fish							
1991	0.72	0.61	0.62	0.64	0.50	0.63	0.98
1993	0.62	0.57	0.58	0.66	0.53	0.64	0.91
1997	0.23	0.29	0.27	0.39	0.20	0.35	0.77
% Δ, 1991-97	-68.1	-52.5	-56.5	-39.1	-60.0	-44.4	1.27
Rapeseed oil							
1991	0.91	0.68	0.73	0.96	0.52	0.92	0.79
1993	0.61	0.42	0.46	0.67	0.48	0.65	0.71
1997	0.34	0.25	0.27	0.51	0.25	0.46	0.59
% Δ, 1991-97	-62.6	-63.2	-63.0	-46.9	-51.9	-50.0	1.26
Cabbage							
1991	0.050	0.052	0.051	0.053	0.033	0.051	1.00
1993	0.038	0.047	0.046	0.056	0.050	0.055	0.84
1997	0.038	0.050	0.047	0.066	0.032	0.061	0.77
% Δ, 1991-97	-24.0	-3.8	-7.8	24.5	-3.0	+19.6	3.51
Rice							
1991	0.140	0.129	0.131	0.144	0.121	0.142	0.92
1993	0.118	0.101	0.104	0.135	0.104	0.131	0.79
1997	0.076	0.095	0.090	0.152	0.058	0.135	0.67
% Δ, 1991-97	-45.7	-26.4	-31.3	5.6	-52.1	-4.9	6.39
Flour							
1991	0.122	0.131	0.130	0.148	0.121	0.146	0.89
1993	0.127	0.108	0.111	0.144	0.145	0.144	0.77
1997	0.068	0.081	0.077	0.153	0.068	0.137	0.56
% Δ, 1991-97	-44.3	-38.2	-40.8	3.4	-43.8	-6.2	6.58

¹Data shown are CHNS community survey data; figures are free market prices for each item in each community, divided by prevailing daily wage for an ordinary male labourer reported for each community.

Reductions in prices were largest for oils and animal foods

Relative prices in urban areas declined dramatically for oils (63 percent) and animal foods (35-68 percent), with smaller reductions in the prices of rice (26-46 percent) and flour (38-44 percent). Price changes for cabbage (the main vegetable consumed) – already inexpensive – ranged from negligible (-7.8 percent) to moderate (-24 percent). Similar price changes were observed in urbanized rural areas, with large reductions in the relative prices of oils, animal foods and cereals, but small or negligible changes in cabbage prices. In comparison, in less urbanized rural areas, there were smaller relative price changes for animal foods as well as oils, while relative prices actually increased substantially for cabbage, with small increases in rice and flour prices.

FIGURE 8
Trends in pork prices relative to prevailing male wages by urbanicity level



DISCUSSION

Urbanization is profoundly linked with the rapid shifts in the stage of the nutrition transition in China. In a very short time frame, between 1991 and 1997, there were extremely large increases in overweight in this sample of young Chinese adults. These increases were concentrated not in the most urbanized areas, but in less urbanized urban settings – smaller cities and suburban areas – where infrastructure and resources that characterize the urbanization process are being put into place. There were also very high increases in overweight in urbanized areas officially designated as rural, especially in areas where urbanicity levels were high. Particularly within urbanized settings, both absolute levels and increases in overweight among low-income adults were substantial. Indeed, in the most urbanized areas, low-income women generally had higher levels of overweight than those with higher incomes.

Increases in overweight were accompanied by striking changes in diet composition. During this six-year period, adult diets became much richer in dietary fats from both edible oils and animal foods. The majority of the increased fat consumption came from added oils, and the proportion of fat from added oils increased with time: 53.1 percent in 1991, 54.8 percent in 1993 and 60.7 percent in 1997. Edible oils and animal foods appear to have displaced cereals, consumption of which has declined drastically over the same period, particularly in urbanized areas. In contrast, consumption of vegetables remained fairly stable over time.

As with changes in overweight, there was important heterogeneity in these dietary shifts associated with levels of urbanicity. In general, the most striking changes took place in less urbanized urban areas and in urbanized rural areas – areas experiencing the most rapid increases in overweight. In less urbanized urban areas, there was a marked increase – 16.9 to 60.5 percent – in the proportion of adults consuming high-fat diets between 1991 and 1997. Similar trends took place in urbanized rural areas, with the prevalence of high-fat diets increasing from 28.3 to 57.7 percent. As a result, more than 50 percent of adults living in all urbanized areas had high-fat diets by 1997. However, the contribution of edible oils to these dietary fat increases was marked only in low-urbanicity urban communities; increases in edible oil intakes in urbanized rural areas were relatively small

(12.8 versus 54.7 percent). The proportion of fat from plants rose from 50.1 to 67.5 percent in less urbanized urban areas, while the proportion in urbanized rural areas was 49.2 to 49.5 percent in 1991 and 1997, respectively. These shifts in dietary composition may have contributed to the maintenance of high levels of energy intake in low-urbanicity urban environments. Mean energy intakes in these communities actually increased over time, in contrast to stable intakes or declines in other areas. Several studies suggest that increasing energy density, such as that resulting from greater added fat content, may promote larger food intakes (Rolls, 2000).

Edible oils also contributed to increases in fat consumption in truly rural areas. Although less than 25 percent of residents in these areas had high-fat diets, there were large increases in oil intakes in these communities (from 34.4 to 41.2/day), and the proportion of fat from plant oils rose sharply (56.5 to 66.9 percent). In contrast, oil consumption did not change meaningfully in the most urbanized areas (about 47 percent of total fats). Consequently, intakes in less urbanized areas eventually exceeded levels in highly urbanized urban settings; intakes in the most rural areas were not much lower than consumption levels in the most urbanized settings. By 1997, mean intakes of edible oils in all types of communities exceeded the maximums recommended by both Chinese (25 g/day) and United States dietary guidelines (about 44 g in a 2 500 kcal diet, given added fats constituted about 53 percent of total fats, assuming a total of 750 kcals/83 g of fat).

Traditionally, the Chinese diet contained small quantities of animal source foods, which helped to facilitate its low-fat content. As with dietary fats, there were particularly large increases in less urbanized urban areas and in urbanized rural areas. By 1997, animal food intakes remained low only in the most rural areas, where mean intakes were about half the size of those in other types of communities. Over time, animal foods and oils were substituted for cereals: shifts in cereal consumption within each type of community essentially mirrored changes in animal food and oil intakes, with the largest declines observed in low-urbanicity urban areas and highly urbanized rural areas. Following these increases, mean animal food consumption levels in all urbanized settings in 1997 were in the range recommended by Chinese dietary guidelines: 200 g in total (Chinese Nutrition Society, 2000). However, these recommendations emphasize lean meats, while the majority of meats consumed were high in fat. Mean animal food intakes were also comparable to the maximum amounts recommended in United States dietary guidelines (142-213 g based on two to three servings of 2-3 ounces/57-85 g each).

Economic and structural changes related to urbanization have probably played a key role in these dietary shifts. During this relatively short time period, there were very large decreases in food prices relative to wages. This was largely attributable to the faster increases in wages in urban areas. These changes made animal foods and edible oils increasingly accessible. In contrast to animal foods and oils, the relative price of cabbage actually increased over time in rural CHNS communities, remaining stable in urban areas. Furthermore, although there were substantial reductions in the price of cereals in urban areas, there was on average no change in relative prices of these foods in rural areas. As shown previously by Guo *et al.* (1999), consumers are highly responsive to changes in food prices; demand for animal foods such as pork and eggs, as well as for edible oils, is highly elastic. There has been a marked structural shift in the income-price-consumption relationships for key foods over time: a pronounced increase in the income elasticity of dietary fats, accompanied by income increases, has helped to promote higher intakes of fats (Guo *et al.*, 2000; Popkin and Du, 2003, in press). These changes in elasticity have been observed across the income spectrum, but have been most marked at the lower ends:

low-income group elasticities have changed the most, making them more likely to increase their intakes of vegetable oils and pork in response to price changes.

Dietary shifts were generally similar among subjects with relatively low incomes as in high-income groups. With regard to lower-income adults, individuals with high incomes consumed relatively high levels of animal foods and edible oils, and lower energy from cereals. However, particularly in urbanized areas, disparities in intakes across income groups were not always large, and tended to decrease over time. Thus in highly urbanized areas, more than 50 percent of low-income adults, and more than 65 percent of higher-income adults, consumed high-fat diets by 1997. In summary, dietary shifts characterized by increased intakes of animal foods and edible oils, reduced intakes of cereals and relatively little change in fruit and vegetables, have been observed in all urbanized areas, among both high- and low-income adults.

These dietary shifts have been accompanied by changes in activity, including declines in occupational activity and active commuting (Bell, Ge and Popkin, 2001; 2002). There have also been increases in sedentarism during leisure time, associated with growing television ownership, which reached 90 percent of this sample – 95 percent in highly urbanized areas – in 1997. Together, these changes have contributed to the growing overweight in Chinese adults and to the rising levels of chronic disease in China that have been documented elsewhere (e.g. Du *et al.*, 2002). Given the evidence that there is rising overweight in a variety of settings, and the extensive spread of adverse dietary changes, efforts to combat these obesogenic dietary trends need to target both low- and high-income groups, and to include urbanized rural areas as well as urban settings.

Policies and programmes to promote healthful dietary patterns

As part of its urbanization and development policies, China has emphasized rural development, using policies such as the promotion of township and village enterprises that have helped to reduce poverty and supported the development of infrastructure (FAO, 1999). Although not explicitly targeted at improving dietary quality, such policies undoubtedly play a role in the nature and amount of dietary change. By raising incomes and promoting infrastructure development, China's rural development policies may affect not only food security – a key objective – but also the structure of demand and food availability. Policies to counter increased demand for potentially obesogenic dietary patterns, characterized by larger intakes of added fats and animal foods, are needed to accompany rural and urban development efforts.

The National Plan of Nutrition Action developed in 1997 involved intersectoral cooperation between policy-makers in the health and agriculture ministries, as well as other institutes involved in nutrition and food hygiene (Zhai *et al.*, 2002). In addition to food self-sufficiency, the plan's objectives include increases in the production of alternative animal food (poultry and fish) and protein sources (soybeans), as well as in vegetables and fruit. Results thus far have been mixed. Meat production has expanded substantially over time, almost keeping up with demand: meat imports were 1.7 percent of the total supply in 1990 and 3.6 percent in 2001 (FAO, 2003). Although poultry consumption remains much lower than other meats (67.7 g/day in 1997), both production and intakes have increased, from 7.3 to 12.9 g/day between 1991 and 1997. Similarly, fish intakes increased from 22.6 to 27.8 g/day. However, expansion of soybean production has been slower (Geissler, 1999). Both availability (13.7 kcals/capita/day in 2001; FAO 2003) and reported intakes (39.0 g/day in 1991 and 44.6 g/day in 1997 in the CHNS) of pulses remain low.

Subsidies, price adjustments and other policies have been used to promote vegetable production and consumption in urban areas, as well as in regions where consumption is low (Zhai *et al.*, 2002). The impact of these policies is thought to be positive, although data are limited. Indeed, while vegetable consumption declined substantially during the 1980s, changes in intakes have been smaller and more inconsistent in the 1990s (Du *et al.*, 2002). In contrast with intake data, food availability data suggest that there have been substantial increases in vegetable production in China, from 67 to 141 kcals/capita/day from 1990 to 2000 (FAO, 2003). However, the correlation with intakes may be low, as has been found in other countries (Pomerleau, Lock and McKee, 2003). As we have shown, consumption of vegetables is now substantially lower in urbanized areas than in very rural settings, suggesting that, with urbanization, vegetable consumption may be vulnerable to further declines. Additional efforts to maintain and, if possible, increase vegetable intakes may be needed.

China has also implemented a number of other policies and programmes with the aim of promoting lifestyle shifts – including dietary changes – to help slow the increases in obesity and chronic disease. One demonstration project funded by the World Bank and the World Health Organization (WHO) in the city of Tianjin (one of China's largest cities) has focused on improving health in an urban centre. After six years, lower rates of hypertension and stroke mortality in the demonstration areas compared to the city as a whole suggest that the project achieved some success in reducing risk factors for these conditions (Zhai *et al.*, 2002). The extent to which changes in diet and activity patterns played a role is uncertain (Tian *et al.*, 1995a; b). Another important initiative has been in developing education efforts to encourage healthful dietary patterns, including the development of dietary guidelines and the “Chinese pagoda” (Chinese Nutrition Society, 2000). Dissemination efforts have not been widespread and, despite a positive impact on knowledge, there has been little evidence of change in dietary behaviour (Zhao *et al.*, 2001). In addition to efforts to influence dietary patterns, a 1995 policy asked schools to emphasize physical education as well as classroom learning, to promote higher levels of activity and help to reduce early obesity (Zhai *et al.*, 2002). Again, there are few data on the impact of these policies, which are believed to be limited so far.

A wide range of other policy and programme options may be considered to combat further the unhealthy dietary trends associated with urbanization. Studies of food group elasticities in China, as well as intervention studies in the United States, suggest that price changes that favour more rather than less healthy foods may be highly effective (French, 2003; Guo *et al.*, 1999). Because of the cross-price elasticities (which influence how foods are substituted for others when prices change), as well as persistent undernutrition in some areas, price policies must be carefully considered to ensure the absence of adverse effects (Guo *et al.*, 1999; Haddad, 2003). Agriculture and trade policies to influence food supply, such as policies to promote greater availability of soybeans, fruit and vegetables, should be pursued further. It is also important to identify effective nutrition education strategies. Food labels may be one effective approach (Neuhouser, Kristal and Patterson, 1999). In addition, researchers in Brazil have suggested that widespread mass media exposure publicizing the epidemic of obesity, as well as obesity prevention measures, may have helped to shift diet and activity patterns in higher socio-economic status groups (Monteiro *et al.*, 2000; 2002). Given the widespread access to mass media, similar efforts may be beneficial in China. Aggressive food marketing and changes in the food supply are thought to be central forces underlying dietary shifts observed in countries undergoing globalization, urbanization and the nutrition transition (Chopra, Galbraith and Darnton-Hill, 2002; Lang, 1999). Policies to affect the food supply, as well as efforts to market more healthful dietary practices, may be the most direct routes to reduce or reverse these shifts.

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Annex

Overview of the China Health and Nutrition Survey urbanization index

Component	Variables used to generate the component score
Population size	Population
Population density	Population, area
Housing-related infrastructure	Sewer lines, water lines, electric lines and natural gas available in community
Transportation infrastructure	Road type of high quality (dirt, gravel, paved); distance to bus stop and distance to train station short (maximum if $\leq 1\text{km}$)
Health facilities	Highest quality of service available in community or neighbouring area (university hospital, private hospital, city hospital, neighbourhood clinic, work unit clinic, village clinic)
Education facilities	Variety of educational facilities available in community or neighbouring area (preschool, primary school, middle school, upper school, vocational school)
Market availability	Free market stores selling variety of goods located within community, weighted based on number of days per week that stores are open
Communication infrastructure	Television station, radio station, cinema, newspaper, telephone network, postal service, fax service available in community
Economic indices	Average male wages above median; large percentage working outside agriculture; large percentage employed in community
Sanitation	Water plant available; community environment sanitary (excreta absent)

Globalization, urbanization and nutrition transition in a developing island country: a case study in Fiji

Jimaima Tunidau Schultz^{1*}

INTRODUCTION

Definitions of globalization vary considerably, with the term often meaning whatever its user wants it to mean. Contrary to some claims, there is no widely accepted conceptual or operational definition, although it is possible to identify at least four, often overlapping approaches (Reich, 1998).² Given this diversity, it is hardly surprising that its outcomes are hotly disputed, even among those who adopt a similar approach.

From a Pacific island (developing world) perspective, globalization equates with development, and development implies change in at least three areas: economics and trade (from subsistence-and-barter to monetized economy); technological (from traditional/manual-mechanical to modern/electronic); and sociocultural (from traditional knowledge, beliefs and values to new knowledge, beliefs and values). Although development and change might benefit a community, or at least some of its members, this is not an automatic or uniform outcome. As this paper outlines, development, change and globalization have been far from even or beneficial for those in Fiji or in the wider Pacific. Globalization carries with it many human and social implications often ignored by those whose thinking appears to be dominated by economic models, trade flows and visions of a new economic order.

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² Approaches to globalization include the following (Reich, 1998), with some blurring of boundaries.

- i) As a contemporary historical period that began around the end of the Cold War when political/ideological alliances in place since the end of the Second World War began to change.
- ii) As an economic phenomenon that includes deregulated markets; privatization of assets; a retreat of the state from its social responsibilities; cross-national distribution of products; diffusion of technology; and integrated capital markets.
- iii) As an essentially sociopolitical phenomenon, with globalization typified by a blending of values around the principles of capitalism and democracy with an American emphasis, i.e. American hegemony. "Globalization is the latest label for capitalism, colonialism and imperialism expansions combined" (Finau, Wainiqolo and Cuboni, 2002:13).
- iv) As a technologically driven social revolution involving a shift from industrial capitalism to a post-industrial concept of economic relations leading to the emergence of a "whole new economy". This group sees the world as a single, specialized but interdependent market and refers to globally integrated production; the privatization of state assets; and technological linkages across national borders

In this paper, Fiji will be presented as a case study. However, by way of introduction a few background observations will be made to place the Pacific region in context before referring more specifically to Fiji.

The 22 island nations of the Pacific cover an area about the size of Europe, Asia and North America. The total regional population is small, with approximately 7.6 million people divided into three main cultural groups: the largest is Melanesian (around 6.4 million), then Polynesian with approximately 0.62 million and the smallest, Micronesia, has a population of approximately half a million. In terms of countries, Papua New Guinea has the largest population, with 4.6 million persons. Tokelau has the smallest, with 1 500 inhabitants. Fiji's population of 0.82 million in 2003 falls in between (Pacific Regional Statistics, 2003).

Before the Second World War, each island nation was essentially self-sufficient and culturally self-contained, living in an ecologically balanced relationship with land and ocean. Anthropological evidence indicates that the Melanesian and Polynesian people in particular had good nutritional status, were physically impressive and lived in healthy, robust, communally oriented societies (Coyne, 2000). While this may sound like romanticizing the past, it is a true reflection of historical reports.

Since the 1950s, international actors have introduced the concept of development into the region. Effective subsistence-and-barter economies have been gradually, sometimes abruptly, replaced by monetized economies dependent on cash crops, world markets and gyrating commodity prices. With this have come new wants rather than needs, new lifestyles, the notion of unemployment and the invention of poverty. At least three iniquities are experienced: (i) the concept of "development dependency"; (ii) inequitable distributions of wealth; and (iii) various forms of deficiency and deprivation. The people and governments of the region have had to battle with a particular view of the world that others wish to create.

"There is a sense in which rapid economic progress is impossible without painful adjustments. Ancient philosophies have to be scrapped; old social institutions have to disintegrate; bonds of cast, creed and race have to burst; and large numbers of persons who cannot keep up with progress have to have their expectations of a comfortable life frustrated. Very few communities are willing to pay the full price of economic progress."

Measures for the Economic Development of Underdeveloped Countries. New York, Department of Economic and Social Affairs, United Nations, 1951. In Escobar, 1995: 3.

What has been ignored by some is that traditional societies had developed ways of defining and treating human, rather than corporate needs. These were, and to some extent still are, based on visions of community and sufficiency. Furthermore, they were effective. Unemployment, poverty and other forms of deprivation and lifestyle diseases were not an issue. These are the gifts of development.

Communities do not live or function in a social vacuum. Our cultures contain important value differences that reflect substantial differences in priorities and preferences. Yet much discourse on economic development, trade and technological change ignores this basic reality.

TRENDS AND CHANGES

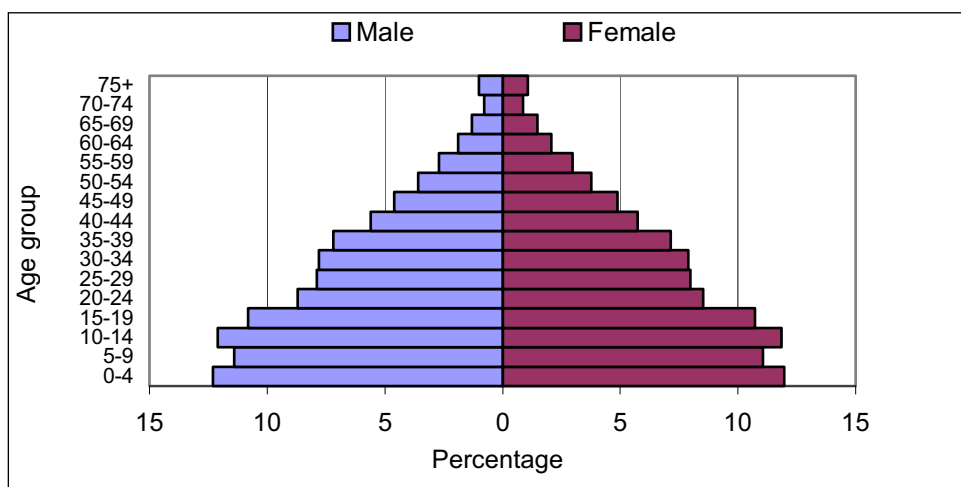
Demographic profiles

Fiji's population (approximately 820 000 in 2003), consists of two very different ethnic groups: indigenous Fijians (51 percent of the total) and Indians (44 percent) who were transported to Fiji

by a colonial government between the 1880s and 1926 to work in the sugar industry. A third category, a mixture of Rotumans, represents the remaining 5 percent (Fiji Bureau of Statistics [FBS], 2003).

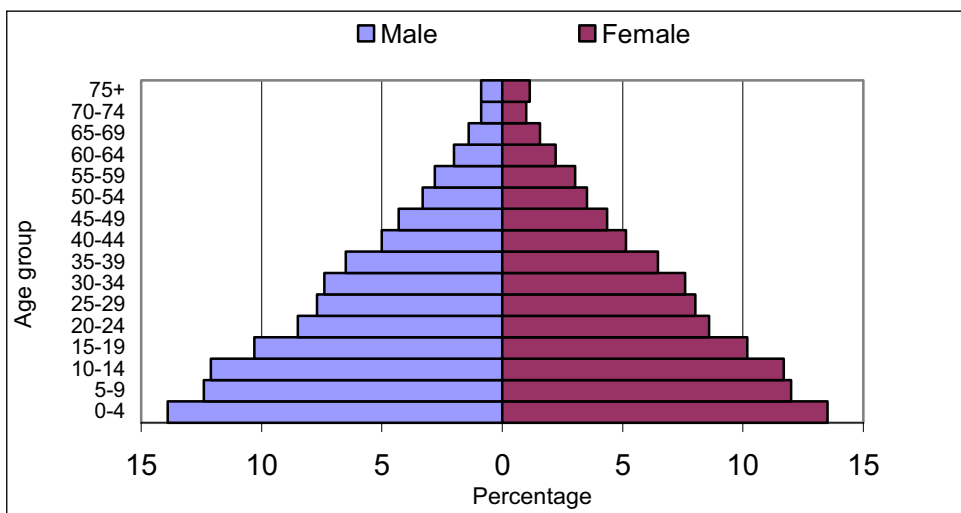
Three demographic pyramids are shown. Figure 1 shows the total population, Figure 2 indigenous Fijians and Figure 3 Indians. Figures 2 and 3 indicate important differences between the two ethnic communities. The Indian profile shows: (i) a drop in fertility over the past decade; and (ii) minimum to no-growth in people of 25-44 years old consistent with considerable emigration. These characteristics are also consistent with the social and political uncertainties faced by the Indian community following the military coups of 1987 (see Broad economic patterns on p. 211).

FIGURE 1
Population pyramid for total population, 1996



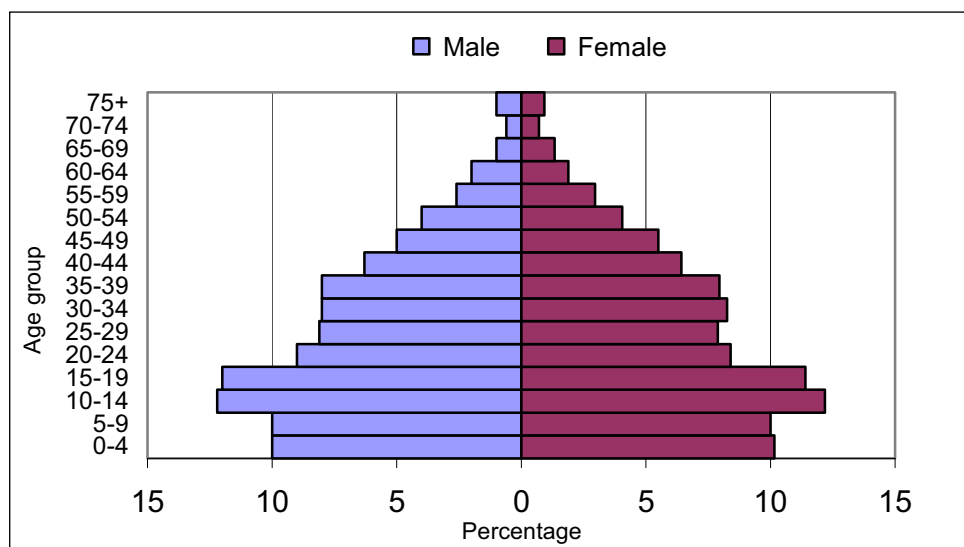
Source: 1996 Population and Housing Census.

FIGURE 2
Population pyramid of Fijian population, 1996



Source: 1996 Population and Housing Census.

FIGURE 3
Population pyramid of Indian population, 1996



Source: 1996 Population and Housing Census.

Trends in urbanization

Population mobility and urbanization

Population mobility and urbanization are commonly regarded as important indicators of economic development (Graig, 1993) as well as the extent to which a country has become monetized and potentially part of the global economy (Chandra, 1990).

By 1996, Fiji's urban population represented approximately 46 percent of the total population (Table 1). This suggests a relatively urbanized community when compared to similar developing countries. United Nations statistics indicated that similar countries possessed an average urbanization level of around 34 percent into the mid-1990s.

TABLE 1
Urbanization rates for Fiji, 1966-1986

Year	Urban population	% of total population	Urbanization rate
1966	159 259	33.4	2.8
1976	218 495	37.2	3.9
1986	277 025	38.7	1.5
1996	359 495	46.4	(not provided)

Source: FBS, 1989; FBS, 1998.

Fiji's urban population is unevenly distributed across its three main islands (Viti Levu, Vanua Levu and Taveuni) and 300 smaller islands. By the mid-1990s, the main island of Viti Levu accounted for a little over 90 percent of Fiji's total urban population which, in turn, accounted for around 45 percent of that island's total population. Of Viti Levu's urban population, almost all (93 percent) lived in five urban areas: the greater Suva area (158 000), Nausori (14 000), Lautoka (39 000), Nadi (15 200) and Ba (10 300) (FBS, 1998). This uneven distribution converts to population densities of between 67 and 90 persons/km² for the Central Division (containing the greater Suva area), to only seven per km² in the smaller scattered islands of the Eastern Division (FBS, 1998).

Reasons for a disproportionate and growing urban population in the greater Suva area are attributed to three main factors: (i) search for paid employment and a cash income – the “push” of rural poverty combined with the “pull” of urban employment; (ii) education for children and young adults; and (iii) curiosity mixed with the lure of town/city excitement. However, since the early 1980s, at least three factors have combined to stall economic development and create a decline in urban employment. These factors are: (i) difficult trading conditions and falling commodity prices as a consequence of globalization; (ii) drought followed by cyclones; and (iii) inappropriate advice from the International Monetary Fund (IMF) pushing a globalization agenda (Lal, 1992; Robertson and Tamanisau, 1988).

Two problems of urbanization

Urbanization and urban drift associated with economic development have created at least two different sets of problems.

One relates to the provision of housing, infrastructure and other services to accommodate a rapidly growing urban population. These costly developments, constrained by budgetary considerations, place government and other agencies under unrealistic pressure to perform and deliver.

The other lies in the need to provide employment for new and old urban dwellers, many of whom possess few marketable skills. First-generation indigenous Fijian urban dwellers in particular usually leave behind a village-level subsistence-and-barter existence: their challenge is to learn new survival skills in a competitive, cash-based economy where the lifestyle is different, few paid jobs are available and urban poverty and survival become a new reality.

Commonly regarded as indicators of development (e.g. Millennium Development Goal indicators), infrastructure, services and amenities are considered next.

A possible third problem is the creation of a sustainable food supply for the urbanized communities.

Indices of development and change

Amenities and services: indicators of development

Standard indices indicate that Fiji has a relatively high level of human development with a Human Development Index (HDI) rating of 0.754 (UNDP, 2003).

Adult literacy in English is 93 percent for Fijians, and around 85 percent for Indians, while approximately 98 percent of children between six and 14 years of age attend school (Department of Information, 1998).

Fiji recently undertook a Household Income and Expenditure Survey (HIES), the results of which were published in 2002. Relevant data from this survey are indicated together with Bureau of Statistics census data (for the whole of Fiji), to permit comparison (Table 2).

TABLE 2
Comparison of HIES 2002 and the 1996 census

Amenity	Urban		All Fiji	
	HIES	% of total	Census 1996	% of total
House (with concrete outer wall) – more permanent	40 903	48.9	33 614	49.7
Safe water	80 412	96.1	62 845	92.9
Electricity	75 647	90.5	58 957	87.1
Television	64 212	76.8	46 698	69.0
Telephone	48 969	58.6	31 500	46.5
Use of car	21 815	26.0	17 349	25.6

Source: FBS, 2003.

Perhaps not surprisingly, Table 2 indicates that urban households generally possess a higher percentage of basic amenities with the largest urban/rural differences in urban access to television and a telephone. Approximately 60 percent of Fiji's population have direct access to commercially generated electricity and of this, around 40 percent is generated from local resources (e.g. hydropower), and 60 percent using imported fuel (Department of Information, 1998).

Transport

Air. Fiji has a large international airport (Nadi), a secondary international airport close to Suva, a successful profit-making international airline (Air Pacific), and smaller privately owned domestic air carriers servicing numerous smaller airstrips in regional centres and outer islands. Nadi International Airport is the biggest and most developed international airport in the Pacific Region. It is regarded as the Pacific gateway to the rest of the world.

Sea. As a maritime country, shipping and other maritime services are well established, with an inter-island shipping fleet, roll-on roll-off ferries, private fishing fleets, wharves, container terminals and a quarantine and customs service in major coastal centres. Although services exist, inter-island shipping is still problematic and often infrequent.

Roads. The three large islands have a good to adequate system of major roads and bridges linked by a network of sealed and unsealed secondary roads. Overall, approximately 20 percent are tar-sealed while on Viti Levu, the figure is almost 80 percent (Department of Information, 1998). These are serviced by a system of privately owned bus lines and taxis that provide a relatively inexpensive form of transport.

Vehicle registrations. In 2001, 2 207 new private vehicles were registered; in 2002 this increased to 3 580, an increase of just over 60 percent. The number of registered new buses was 25 in 2001 and 40 in 2002 (a 60 percent increase). Newly registered taxis, rental and hired cars were 213 in 2001 and 323 in 2003 (a 52 percent increase) (FBS, 2003). Motorcycles are relatively rare. Total vehicle numbers for the country could not be ascertained making a per capita calculation unavailable.

The combination of an effective public transport system (buses and taxis), and increasing numbers of privately owned vehicles, suggest an overall decrease in walking activity. This provides a very crude societal indicator of decreasing physical activity among the adult population.

Technology diffusion

Fiji is serviced by an effective international (Worldwide Direct Dialling) and national telecommunications system including mobile phones (owned by approximately one in eight persons) and a small number of Internet cafés (The Review, 2003).

No statistics for computers were available, although most businesses and many private homes in urban areas possess their own computers.

Television transmission covers most of the main islands using English, with limited coverage in Fijian and Hindi. Two satellite receiver dishes permit international retransmission of programmes; a pay television service (Sky Fiji) is also available.

Broad economic patterns

The main feature of Fiji's economic structure is a dependency on primary industry, which is easily upset by weather conditions and fluctuations in international prices.

Economic development in Fiji since 1970 might be described in terms of four to five identifiable cycles: (i) growth between 1970 and 1979/80; (ii) slowdown and recession between 1980/81 and 1991/92; (iii) growth between 1992 and 1998/99; (iv) slowdown and regression from 1999 to 2002; and (v) recovery and limited growth in 2003.

It is notable that both periods of major economic stagnation and recession (ii and iv above), were followed by an increase in severe political instability (military coups in 1987 and an attempted coup in 2000). Once set in motion, these politically destabilizing events further damaged an already weakened economy, causing additional widespread economic hardship.

The economic and political antecedents to the 1987 coups have been well documented, with causes commonly attributed to four main factors: (i) an economic recession attributed to falling commodity prices linked to globalization; (ii) government implementation of "structural adjustments" and a wage freeze advocated by international organizations such as the World Bank and International Monetary Fund according to a globalization agenda; (iii) social disruption and cultural degradation as a consequence of economic development and modernization; and (iv) local political opportunism (Schultz, 2003). There are currently signs of a tentative economic recovery; however, the political situation remains fragile.

Between 1997 and 2001, Fiji had an annual trade deficit from F\$500 to F\$600 million with food imports representing either the third or fourth largest import (after manufactured goods and machinery and transport equipment), approximately equal to imported mineral fuel. In 2002, the annual gross domestic product (GDP) per head of the population was F\$4 222 (approximately US\$2 250) (FTIB, 2003).

ROLE OF DEVELOPMENT AND URBANIZATION ON FOOD SUPPLY

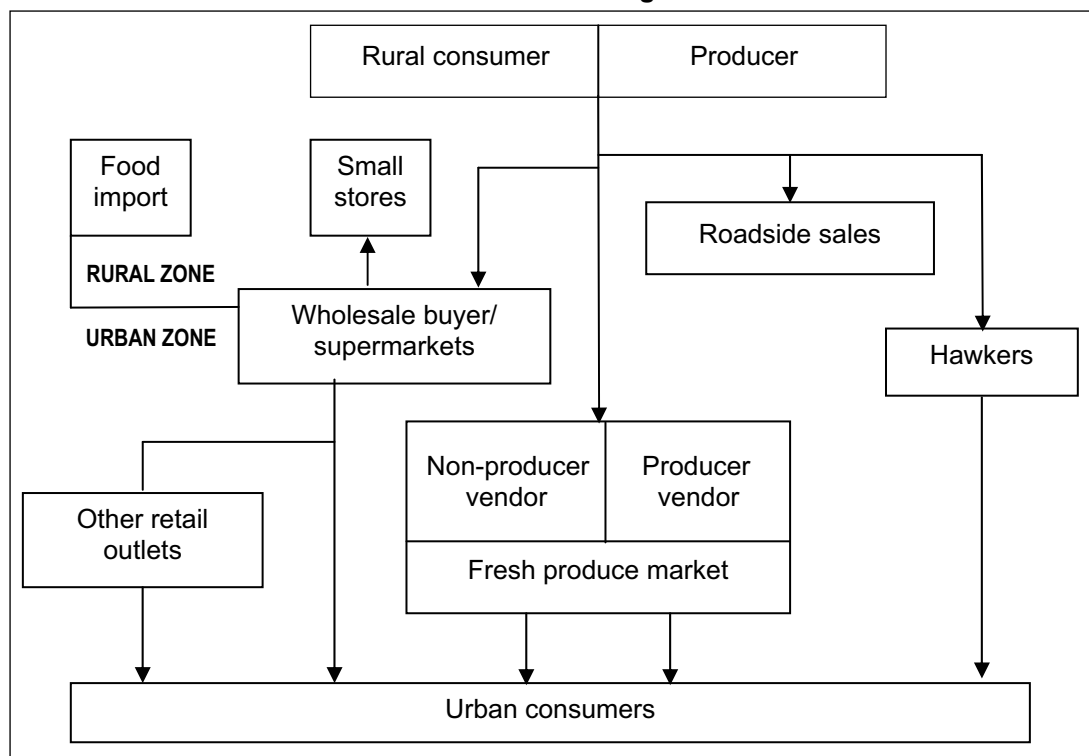
In Fiji, notions of development have been strongly influenced by advice tendered by the World Bank and International Monetary Fund, based on principles of economic globalization (Finau, Wainiqolo and Cuboni, 2002). In this setting, economic development has changed not only the Fijian economy, but the distribution and nature of the population from a rural subsistence-and-barter community to an urban wage-dependent monetized one. Fiji now has an agricultural economy based on one main cash crop – sugar, currently under threat – and a few abandoned, unsuccessful cash crops (bananas, cocoa and coffee), ginger and kava (*yaqona*) with a doubtful future, and highly vulnerable non-food manufactures (garments, textiles, footwear and some woodchips). There is limited food processing that includes wheat and rice milling, and processing of milk, meat and ginger.

Increasing urbanization has generated the need for a reliable food supply for the urban population. To some extent, nearby rural areas have benefited by moving into vegetable, milk and meat production. However, once self-sufficient in food, Fiji has become increasingly reliant on imported processed foods. Distribution has been a growth industry with many small corner stores plus a rapid increase in larger shops and supermarkets. Fiji now has six identifiable foodstore chains and approximately 70 supermarkets (Chaudhari, 2003).

Knowledge of the food supply chain/system contributes to a better understanding of a nation's food security system. An analysis of the urban food supply system in Fiji identified the food marketing channels (Baxter, 1980). Figure 4 illustrates the flow of commodities from the point of production to the final consumer. It will be noted from the figure that both local and imported foods make up Fiji's food supply system. However, an important growing industry in Fiji, the food manufacturing sector, has not been included. Raw ingredients are imported and processed in the country. They include cereals and meat. The processed products are on the supermarket shelves and in small stores throughout the country.

The distribution pattern illustrated in Figure 4, plus cost, determines the choice available to families. In general terms, the more complex the distribution chain, the greater the cost to consumers, even though the food might be locally produced (Schultz, 1997).

FIGURE 4
Produce marketing channels



Source: Baxter, 1980.

Baxter (1980) identified a number of factors contributing to a reliance on a cash-based food supply chain in Fiji. These include the following.

- Families cut off from traditional lands and unable to grow their own food. They become totally reliant on cash (or limited credit) to buy food.

- As urban centres spread, more land is required for housing and industrial purposes with less available for planting food. Home food gardens become fewer.
- Despite a reasonable transport system, traditional family/clan food support is no longer available.

As a consequence, the cheaper imported foods become a major source of food supply with nutritional quality usually compromised by cost. An example is fish – fresh fish is more expensive than tinned fish, so tinned fish is consumed. Tinned corned beef may also be perceived to be cheaper than most fresh meat, so tinned meat is eaten (Schultz, 1997).

Dietary change

Predevelopment

Prior to development, in order to survive, communities were self-sufficient and food secure via subsistence and barter. In times of plenty, food was shared and excess food was preserved using traditional methods. The communal and mutual care philosophy of Fijian society meant that no one went hungry.

The traditional diet consisted of food from both land and sea, usually consumed twice a day: morning and evening. Meals were simple, balanced and nutritious, consisting of starchy root crops as the main energy source; fish, crabs and shellfish as protein; and local green leafy vegetables as an accompaniment. Coconut used in cooking was the main source of fat. Meat was eaten only occasionally (pork, chicken and turtle), usually at special feasts. Fruit and grilled starchy roots were eaten while gardening. Leftover starchy foods from a previous meal were eaten when out fishing. The main drink was green coconut juice.

Post-development

Development brought many dietary changes, including eating patterns and types of food. The number of times food was consumed during a day increased, and the nature of the food changed from unprocessed to refined and processed. Indians brought their own eating patterns based on cereals and lentils. An impact of development on diet is that more variety became available.

During the early period of urbanization, food supply to urban areas was generally insufficient and of limited variety. Food importation began to service the ever more numerous colonial expatriate population in the country. This marked the beginning of an increasing dependency on overseas food sources. Fiji changed from being self-sufficient to relying more and more on imported food such as rice, tinned meat and fish, wheat flour, mutton, beef, pork, sweet biscuits and sugary drinks. For the Fijian urban population, cost, availability and convenience are increasingly becoming important determinants of eating patterns (ACIAR, 2002). From an economic perspective, food imports also impacted on the national balance of payments and foreign exchange reserves.

Eating patterns have changed more among indigenous Fijians than Indians (ACIAR, 2002). On a day-to-day basis, urban Fijians have shifted from the more traditional but expensive taro (*dalo*), to cheaper cassava and bread, followed (in order of importance) by rice and wheat flour biscuits. Intake of breadfruit and plantains remains about the same. Intake of animal protein (red meat, both fresh and tinned) has increased substantially compared to fish. Food choice for Fijians is determined mainly by value for money followed by ease of preparation. For Indians, value for money and personal preference were the two major determinants of choice (ACIAR, 2002).

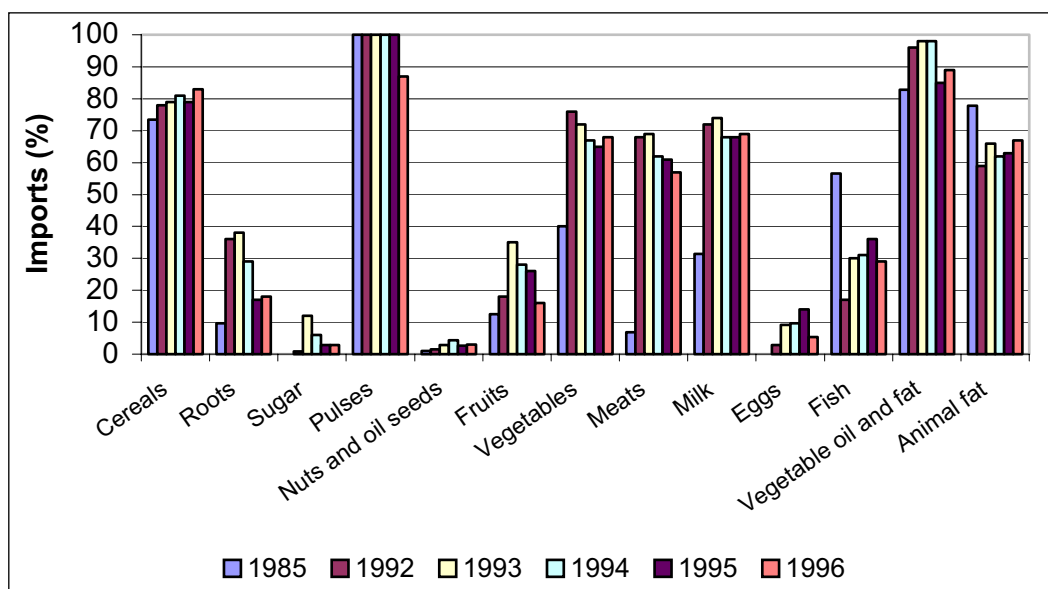
Role of imported and traditional foods

Both local and imported foods play important roles in the diet of the Fijian population as previously illustrated in Figure 4. For example, urban dwellers typically purchase fresh food from fresh produce markets, roadside sales, hawkers or supermarkets; a low-income subgroup still attempts to maintain home-grown food, generally starchy local food (cassava), grown on vacant land wherever it can be found (Saito, 1995). Cultural food patterns remain strong especially at festival and feast times (Schultz, 1997).

Imported food

Figure 5 shows the comparative percentages of major food groups imported in 1985 and 1992 to 1996. As can be seen, all pulses were imported, followed by vegetable oil and fat, cereals (80 percent or more imported), and vegetables, meat, milk and animal fat (from 60 to 80 percent imported).

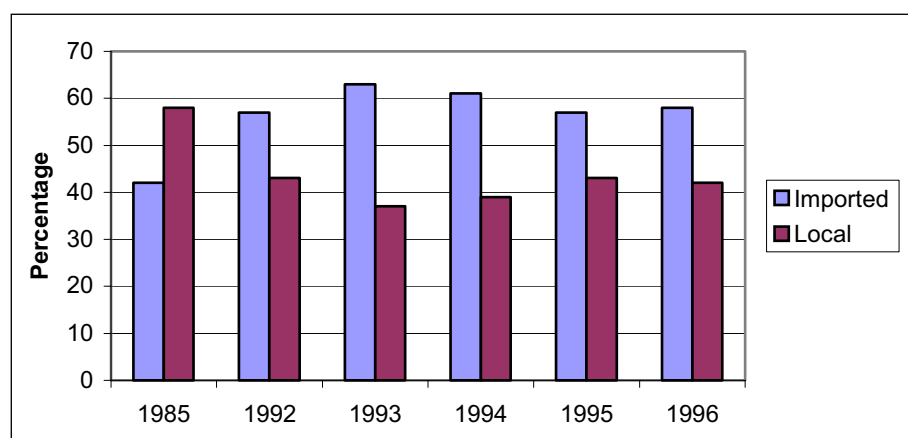
FIGURE 5
Percentage of food imported by food group



Source: National Food and Nutrition Centre, 2003a.

A different breakdown shows the percentages of energy supply on a per capita basis derived from imports as well as from locally grown food (Figure 6). These data indicate a consistent pattern of just over half the total dietary energy being supplied by imported food between 1992 and 1996.

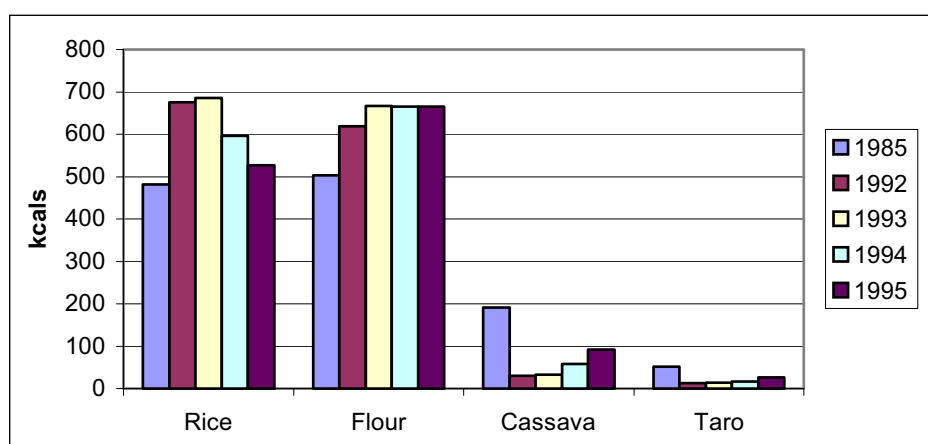
FIGURE 6
Percentages of energy supply (per capita/day) derived from imports and from locally available foods, 1985-1996



Source: National Food and Nutrition Centre, 2003a.

Figure 7 shows the availability of kcals from four major energy food groups – rice, flour, cassava and taro – in 1985 and 1992-1995. The figure clearly shows that cereal has become a major energy food. It has replaced the traditional starchy root taro (*dalo*). Cassava appears to be more important than taro. Although taro is a “status” and more nutritious food, its relatively high cost has made it less accessible to the economically poor families in urban areas.

FIGURE 7
Sources of kcals from cereals and root crops, 1985-1995

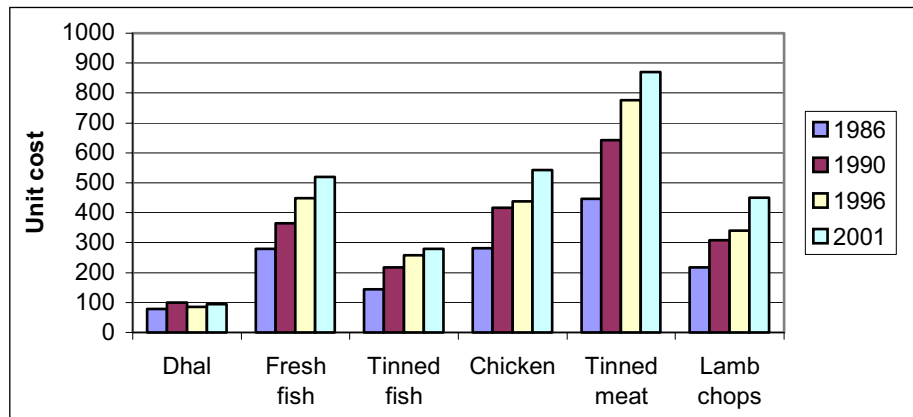


Source: National Food and Nutrition Centre, 2003a.

Although not included in Figure 7, the case of noodles is interesting. In the 1982 national survey, they did not appear as a food item but ten years later (1992), they appeared in the top 12 of the common energy foods eaten in both urban and rural areas, especially among Fijians (Saito, 1995). Generally speaking, commercially processed food has become an indispensable part of Fiji’s diet and, overall, there has been a marked increase in the consumption of animal food products, animal fat and vegetable oil: a change more evident in urban areas (Saito, 1995; ACIAR, 2002). A reported increase in cereal intake (e.g. rice) as an energy source has been attributed to its lower cost.

In general terms, cost affects food choice among urban populations. Figure 8 indicates a gradual increase in the unit cost of protein foods over the years (1986-2001). Tinned fish and lamb chops are cheaper than fresh fish, the traditional source of protein in the Fijian diet. Although a popular food item, tinned meat is clearly the most expensive. However, taste preference may be a much stronger factor in this case and illustrates the complexity of the factors that determine food choices.

FIGURE 8
Unit cost of protein food



Source: National Food and Nutrition Centre, 2003a.

Emerging new food outlets and food hygiene concerns

Supermarkets are the most striking feature of the urban food supply system. The growth in this industry has been remarkable over the last 15 years. As stated previously, Fiji now has six relatively large supermarket stores with approximately 70 chains operating in urban centres. Supermarkets carry both local and imported processed foods with limited amounts of local fresh foods. The major urban areas have also seen a proliferation of small fast food services, restaurants, street vendors, street barbecues and home-based caterers. Large global fast food providers such as McDonald's, Kentucky Fried Chicken and various pizza chains have appeared during the past decade. Although legislation relating to food and hygiene standards as well as food labelling is in place to protect the consumer, government monitoring and enforcement are inconsistent. The food hygiene standards of the larger commercial chains appear to be better than in local food outlets, but the nutritional status of their products has been the subject of considerable debate. Evidence linking overconsumption of these and similar fast foods to obesity in Fiji remains problematic

Food security

Fiji's increasing reliance on substantial quantities of imported food leaves the country open to outside political and economic pressures. Figures 5 and 6 illustrate Fiji's vulnerability, especially in circumstances where food is increasingly being used as a political weapon by larger developed countries to coerce susceptible countries such as Fiji. During the coups of 1987 and the failed coup in 2000, Fiji's trade partners applied food sanctions in an attempt to punish the insurgents. Unfortunately, such sanctions represent a blunt instrument, with innocent women and children the first to suffer when this strategy is adopted.

Given that Fiji often suffers from cyclones that can devastate local food production, imported food (processed or fresh) is unavoidable if enough food is to be available for the

population. The question that needs to be addressed is the level of reliance on imported food to complement the local supply.

National data show that Fiji has more kcals available per capita/day compared to FAO's stated nutrient requirement (National Food and Nutrition Centre, 2003b). Unfortunately, these figures hide the real picture – that of uneven distribution of food within all sectors of the population. Based on the definition of food security, Fiji is not food secure, in the author's view.

IMPACT OF GLOBALIZATION ON LIFESTYLE³ IN URBAN AREAS

A number of societal characteristics have been attributed to globalization and economic development in Fiji and the Pacific Region. These include changed values involving an encouragement of nuclear rather than extended family households, individualism rather than communalism, the accumulation of wealth rather than sharing, and employment by others instead of self-sufficiency (Finau, Wainiqolo and Cuboni, 2002). These characteristics are contrary to indigenous cultural values and are perceived to assist in undermining them.

The global marketing of products and lifestyles via television in small island countries such as Fiji has become common. Subtle as well as aggressive advertising by transnational tobacco and alcohol companies, in particular, both in print and electronically, appears to be aimed at younger receptive age groups. Generally, such advertising portrays lifestyles that are economically unachievable in local circumstances, generating expectations and a sense of envy and frustration that are socially disruptive for individuals and groups. Between 1997 and 2001 the value of imported alcoholic beverages and tobacco increased by 19 percent (Fiji Bureau of Statistics, 2002a).

While it is difficult to gain a clear picture of alcohol and tobacco consumption over time because of few systematically collected data, available information indicates a prevalence rate for smoking of 46 percent in 1992. It also appears that smoking increased by about 24 percent between 1980 and 1994 (Khaleghian, 2003). An increase in import figures for alcohol and tobacco as indicated above, suggests a growing market.

Data from the Global Youth Tobacco Survey conducted in Fijian schools (1 629 students aged 13 to 15 years) showed that one in five students had smoked their first cigarette before their tenth birthday. One in ten was a current smoker at the time of the survey. More than half the current smokers have fathers who smoke (UNICEF and WHO, 1999). The same survey also found that 40 percent of students had started drinking before the age of ten. About 62 percent of students reported binge drinking. The survey also found that some students were using marijuana, with 7 percent admitting to current use.

Kava (*Piper methysticum*) was consumed by five years of age, and 24 percent of students were drinking it regularly. Of concern is the practice of "wash-down" where, after a kava session, the drink changes to alcohol. Youth drink home brews if they cannot afford to buy alcohol. Anecdotal information indicates that in some instances, young people turn to glue- or petrol-sniffing and marijuana to keep them "high". In order to pay for their habits, youth resort to robbery and other crimes as a way of obtaining money. Increasing unemployment is likely to exacerbate both substance abuse and crime in urban areas.

An issue of concern in Fiji is that overseas litigation against the large transnational tobacco and alcohol companies is causing these companies to cast around for easier

³ Lifestyle refers to wide-ranging behaviours including work patterns, dietary patterns, physical activity, smoking and alcohol consumption. Lifestyle changes are often more pronounced in urban situations where modernization is the norm.

markets. In this respect, and despite smaller populations, the Pacific Region appears to be attracting renewed attention.

A survey of physical activity levels in urban Fiji reported that 58 percent of the population was engaged in sedentary work (clerical activities in the public service, industry and business) (Fiji Bureau of Statistics, 2002b). Also, more people in urban areas (61.4 percent) reported being engaged in "light physical work" compared to those in rural areas (38.8 percent) (Saito, 1995). These results may be directly linked to the differences in lifestyles between urban and rural areas. Urban centres have easy access to a cheaper transport system, television and so on that discourage physical activity.

New forms of entertainment such as nightclubs and bars where licences are often justified on the grounds that they are fulfilling the needs of international tourists, also attract young local people whose liking for these venues tends to lead to family conflict and disputes.

Generally speaking, the influence of globalization is not limited to product promotion *per se*. It also focuses on lifestyle change as a more comprehensive and effective marketing strategy. In this respect, its influence is more subtle and insidious, providing a marketing climate that shows little concern about the negative social implications of cultural degradation (de Vries, 1996), an important issue in this part of the world (Baker, Hanna and Baker, 1986; Finau, Wainiqolo and Cuboni, 2002; Schultz, 2003).

The changing role of women

Increasing numbers of urban women have taken on additional wage-earning responsibilities outside the home to help make ends meet. At the same time they have maintained their traditional role as mother, nurturer and housekeeper. This additional workload has had little to do with self-fulfilment and more to do with economic necessity to ensure family survival in an urban setting.

Women constitute 35.5 percent of the economically active population, and 64 percent of them are engaged in the money economy. Women also make up the largest percentage of those engaged in subsistence activity without a cash income (67.3 percent) (FBS, 2002b). Unemployment rates are highest in urban and peri-urban areas and concern mainly indigenous Fijians.

Women account for a significant percentage of workers in manufacturing (38.1 percent), services (37.6 percent), finance (36.3 percent) and the wholesale and retail trade (36.1 percent) (FBS, 2003). Women in the workforce with young infants often breastfeed for a shorter duration (Saito, 1995) and breastmilk is substituted with infant formula, placing an additional economic burden on the family or the mother.

In urban areas where there is limited support from the extended family, wage-earning women are left with little choice but to hire a child minder or house girl for child care. This has far-reaching consequences because house girls are generally young with little understanding of the relationship between proper child care (food and socialization) and child development. Not only does child care absorb precious income, but it generally provides inadequate care for the child (Schultz, 1997).

MALNUTRITION

Despite Fiji's comparatively high level of development, malnutrition and micronutrient deficiencies are still prevalent in some sectors of the community, with young children and women the most vulnerable.

Birth of underweight infants (below 2 500 g) affects 21 percent of Indian infants and 4 percent of Fijian babies (Saito, 1995). Although most Fijian children are born with above

average weight, their growth slows after three to five months. Hospital records indicate that this relates especially to Protein Energy Malnutrition (PEM), with Fijian babies under three years of age forming the largest group (Saito, 1995). The most common reasons are poverty and inappropriate weaning foods.

Underweight remains a problem for Indian children aged five to nine years (32 percent compared to 4 percent of Fijians of the same age group). Although there has been some improvement in the rate of underweight children since the 1993 National Nutrition Survey, the problem remains high among Indian children (Saito, 1995).

Although breastfeeding initiation is high (92 percent), after three months it declines to below 50 percent for Fijian mothers and approximately 10 percent among Indian women (Saito, 1995). Use of infant formula is strongly encouraged by the multinational manufacturers who provide free samples to hospitals and health clinics. Use of infant formula is associated with two main problems in Fiji: poor hygiene and excessive dilution of the formula to save money (Schultz, 1997). Both practices can result in diarrhoeal disease which contributes to malnutrition. This creates a vicious cycle between malnutrition and diarrhoea and is more of a problem in urban areas because of the shorter duration of breastfeeding.

The prevalence of anaemia in both children and women is high. Forty percent of children under five years and 32 percent of adult Fijian and Indian women are anaemic. Anaemia is typically linked to two outcomes: in Indian women it contributes to low birth weight and results in low energy levels and low productivity in the workplace (Saito, 1995). Anaemia is more prevalent in low-income groups and is attributed to low consumption of iron-rich foods (inadequate iron-rich vegetable sources among Indian women in particular) (Schultz, 1997). Other contributing factors are worm infestation and defaulting antenatal and postnatal care generally linked to poverty.

The National Nutrition Survey carried out in 1993 found that 56 percent of Fiji's adult population (18 years and over) were malnourished (under- and overnutrition) (Saito, 1995). Using body mass index (BMI) as an indicator, 44 percent were within the healthy weight range, 32.7 percent were identified as overweight or obese and 23.3 percent as underweight. More men than women were within the healthy weight range (51.5 and 38.4 percent, respectively). By contrast, more women than men were classified as either overweight or obese (41 and 24 percent, respectively) and more Fijians (37.8 percent) than Indians (26 percent) were in these categories. The survey also found a higher proportion of overweight and obesity in urban areas (34 percent) than in rural areas (23 percent), and the proportion of overweight and obese was significantly higher among those adults who were engaged in light or sedentary activity than those who had high levels of physical activity. Underweight was found mostly among Indian men (30 percent) and women (26 percent) compared with Fijians (19 percent men and 15 percent women).

TRENDS IN HEALTH STATUS IN THE URBAN ENVIRONMENT

It is argued that globalization has created a double health burden for developing small island countries such as Fiji. On the one hand, many communicable diseases commonly associated with poverty are still prevalent, including diarrhoea, respiratory infections and mosquito-borne and parasitic diseases. At the same time, newer non-communicable diseases (NCDs) and lifestyle-related diseases closely linked to economic development and modernization are on the increase because of changing lifestyle patterns, more availability of foods rich in fat, sugar and salt and more consumption of tobacco and alcohol. In urban areas, in particular, increased prevalence rates for circulatory disorders (coronary artery

diseases, strokes and diabetes) have been attributed to changing lifestyle patterns. Cervical and breast cancers are also more common.

The percentage of deaths in Fiji through heart disease increased from 18 percent in 1960 to 38 percent in 1987 to 1988. Cardiovascular disease has been the leading cause of death in the country for the last decade (between 45 to 50 percent of all deaths) (Khaleghian, 2003; Coyne, 2000). The high prevalence of cardiovascular disease risk factors such as smoking, obesity, diabetes and hypertension in urban areas is of concern.

In 1980, a clinical survey reported that the rates of diabetes among Fijians living in urban areas had increased tenfold to 6.6 percent (Coyne, 2000). The 1993 National Nutrition Survey found rates of self-reported diabetes were less than 1 percent of those under 44 years of age, but rose to 10 percent in those above 45 years (Saito, 1995). Indians had markedly higher rates of diabetes with 6.9 percent compared to 3.3 percent of Fijians. The mean BMI of those with diabetes (27 kg/m^2) was significantly higher than those without diabetes (24 kg/m^2). It is suggested that this self-reported survey might have underestimated the true prevalence rates, given that diabetes ranked as the third leading primary cause of hospital admission in 1994 (Coyne, 2000). In 1996 diabetes-related amputation was around ten per week.

Cancer ranks third as a cause of death in Fiji (Coyne, 2000). The three most common cancers in women are cervix, breast and ovary while in men the three most common are prostate, lung and liver. Cancer incidence tends to be higher in wealthier Pacific island countries (Khaleghian, 2003) and Fiji is one of the most developed. Risk factors for most cancers include smoking, alcohol and high-fat diets. Consumption of vegetables and fruit has been linked to cancer prevention. Consumption of these foods has been on the decline, particularly in urban areas.

Obesity is a risk factor for many other NCDs. It is a health problem in its own right as well as a risk factor for cardiovascular disease, diabetes and hypertension. Both longitudinal and cross-sectional studies of anthropometric changes clearly show that modernization and western-influenced lifestyles sustain patterns of significant weight gain in Pacific peoples (Baker, Hanna and Baker, 1986; Friedlaender, 1987). Available evidence indicates that the problem of obesity will not simply go away but will continue to increase in the Pacific as a consequence of changes in lifestyle and diet.

While Fiji represents a particular example, the general principles outlining the linkages between globalization and NCD epidemics have been described by Beaglehole and Yach (2003), who identified a nutritional transition towards diets with a high proportion of saturated fat and sugars which they attributed to global trade and marketing developments. This transition involves the replacement of a traditional diet rich in fruit and vegetables by a diet rich in calories provided by animal fats and low in complex carbohydrates. This diet, in combination with tobacco use and little physical activity, leads to population-wide atherosclerosis and the widespread distribution of NCDs.

One problem ignored or overlooked by supporters of globalization is the limited economic and human resource capacity in small island countries to implement strategies believed to be appropriate. By their nature, NCDs are chronic, long-term diseases and each patient is likely to require health services over many years. At the same time, national economies are suffering as a result of the increasing number of premature deaths of individuals in their prime productive years. According to Khaleghian (2003), the total estimated disease burden for low- to middle-income countries such as Fiji shows that NCDs as a whole account for 42.5 percent of all disability-adjusted life years (DALYs) lost in 1998 as compared to 40.4 percent for communicable diseases and 16 percent for injuries. The largest contribution to lost DALYs was the burden caused by cardiovascular

diseases and cancer, responsible for 37.3 percent of all NCD-related DALYs lost in 1998 (Khaleghian, 2003).

The total cost of NCDs in 1998 for Fiji was estimated to be 1.5 percent of its GDP. Direct cost estimates for NCDs as a percentage of the total health budget for 1998 were just over 11 percent (Khaleghian, 2003). This means that for Fiji with its small economy, the economic cost of NCDs is enormous. Its health system is increasingly burdened by the high and long-term cost of diagnosis and treatment. Sending patients overseas for special treatment is an additional burden on the economy.

PROGRAMMES

From the perspective of a small Pacific island country, problems associated with globalization are perceived to lie beyond their power to influence. There is a perception of helplessness and impotence. This means that few programmes, if any, designed to address problems identified with globalization are funded.

One example from Fiji is that of the National Plan of Action for Nutrition. This plan was endorsed by parliament in 1998. However, more than five years later, no resources have been allocated to implement the plan. Clearly, it is not regarded as a national priority. Yet this was not the impression in 1998. Alternatively, it may be regarded as simply too difficult: a pointless exercise given the international forces perceived to be conspiring to undermine any such plan.

Expenditure on health in Fiji indicated that 72 percent of the budget was to be spent on curative measures, 2.6 percent allocated to prevention strategies and 24.6 percent spent on administration (Khaleghian, 2003). The percentage of health expenditure on preventive measures is indicative of the kind of budget allocated to nutrition promotion

Since 1980, the Ministry of Health has implemented a number of projects to prevent non-communicable and other nutritional deficiency diseases. A few examples are the following.

- (i) A food garden project to address maternal and child health in the early 1980s.
- (ii) Anti-tobacco legislation passed by parliament.
- (iii) In 1999, parliament passed a bill banning the sale (and importation) of fatty meat called mutton flaps in Fiji.
- (iv) In 1999 an Obesity Environmental Audit project was piloted in a peri-urban area of Suva.
- (v) The Ministry of Health is currently working on legislation to fortify flour with iron to address the problem of anaemia.
- (vi) Parliament passed in 2003 a Food Safety Bill which focuses on trade.

Two comments are relevant. First, unfortunately, with the exception of the food garden project, these undertakings have not been evaluated. Their effectiveness is often presumed but unsubstantiated. The food garden project appeared successful while funding from the United Nations Children's Fund (UNICEF) was available. However, since UNICEF's priority has changed, funding has dried up, and the project has died. Apart from an initial evaluation, no impact evaluation has been carried out.

Second, anecdotal evidence indicates that although a ban on the import and sale of mutton flaps is in place, fatty mutton pieces are still sold in supermarkets. Importers are now importing carcasses and then cutting and selling the fatty pieces under other names.

CONCLUSIONS

Generally speaking, the available evidence indicates considerable social, cultural, lifestyle, health and nutrition status change in Fiji over the past two decades. Whether this is attributed to development, urbanization, modernization or globalization, or perhaps all four, is an issue of definition and considerable debate relating to assumptions about the nature of causality.

Many sociocultural indicators of change are qualitative in nature and difficult to quantify. However, this does not mean that they are less important than more readily measured clinically defined markers of health and nutrition. Unfortunately, only the readily measured indicators tend to be used and this provides a simplistic impression that fails to reflect the complex nature of the problem.

Taken overall, evidence of negative social, nutritional and health outcomes linked to globalization and its companion concepts is consistent over a wide range of indicators.

The effectiveness of health and nutrition interventions in Fiji remains to be clearly demonstrated. Factors contributing to this situation include the inappropriateness of many imported interventions; lack of local ownership of these interventions; inadequate/insufficient resources; competing priorities; and absence of evaluation.

RECOMMENDATIONS

The following are based on some of the critical problems and challenges raised in this paper.

- Although multisectoral partnerships are regarded as highly desirable, in reality there are many institutional organizations and personal impediments to be overcome if these are to be implemented. Therefore it is recommended that the Food and Agriculture Organization of the United Nations (FAO) assist small island countries to develop relevant knowledge, skills and attitudes required to facilitate effective cooperative partnerships.
- Whereas since the late 1980s, many small island countries have developed national plans and policies for nutrition designed to address food security, to date very few of these plans have been developed beyond draft form. Therefore it is recommended that FAO provide practical assistance to small island countries in the form of funding and expertise to facilitate the review, adoption and implementation of these plans and policies.
- In recent years FAO has focused on Codex Alimentarius, which is primarily concerned with international trade, but very little has been done about food safety and handling at the community and household level. It is therefore recommended that FAO implement a two-prong approach to food safety issues and initiates community education programmes designed to improve food handling, preparation, processing and storage in small island countries.

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